ORDER NO. KM40210972C2

Service Manual

Telephone Equipment

Caller ID Compatible

KX-TSC10HGW

Integrated Telephone System

White Version

(for Hungary)

SPECIFICATIONS

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Power Source:	From telephone line / From 3 AA(LR6, R6, UM-3) batteries
Memory Capacity:	50 Caller ID memory, 50 Directory memory.
Dialing Mode:	Tone(DTMF)/Pulse (10 pps)
Redial:	The unit redials the last 20 number dialed
Speaker Unit:	Handset; 3 cm ($1^{13}/_{16}$) PM dynamic type 150Ω
Microphone:	Electric condenser microphone
Input Jack:	Telephone Line
Operating Enviroment:	5 ˚C - 40˚C
Dimensions(HxWxD):	83 × 146 × 200 mm
Weight:	Approx. 520g

Specifications are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.
1. Cover plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on worktable.
4. Do not grasp IC or LSI pins with bare fingers.

CAUTION

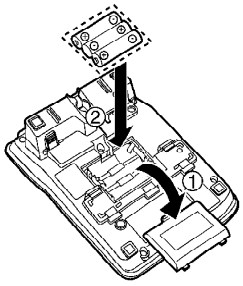
Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's Instructions.

Panasonic

1. BATTERY

1.1. Installing the Batteries



1 Press down in the direction of the arrow and remove the cover (①).

2 Install the batteries in the proper order as shown (②), matching the correct polarity.

3 Close the battery cover.

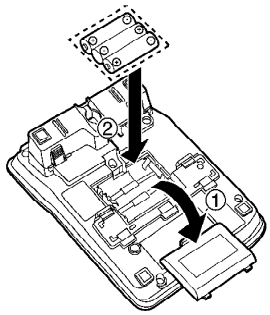
- Batteries are not included in the unit.
- Install three high quality "AA" size Alkaline (LR6) or Manganese (R6, UM-3) batteries. We recommend to use Alkaline batteries.
  Battery life is: —about six months in use of Alkaline batteries.
  —about three months in use of Manganese batteries.
  Battery life may depend on usage conditions and ambient temperature.

The following features do not work without batteries.

—Display
—FLASH button
—Programming
—Caller ID services
—Memory redial
—Viewing/dialing the Speed Dial List while the handset is on the cradle

1.2. Battery Replacement

If "▭" flashes, the battery power is low. Install new batteries as soon as possible.



1 Disconnect the telephone line cord from the unit.

2 Press down in the direction of the arrow and remove the cover (①).

3 Replace the batteries with new ones using correct polarity (+, –) (②), and close the cover.

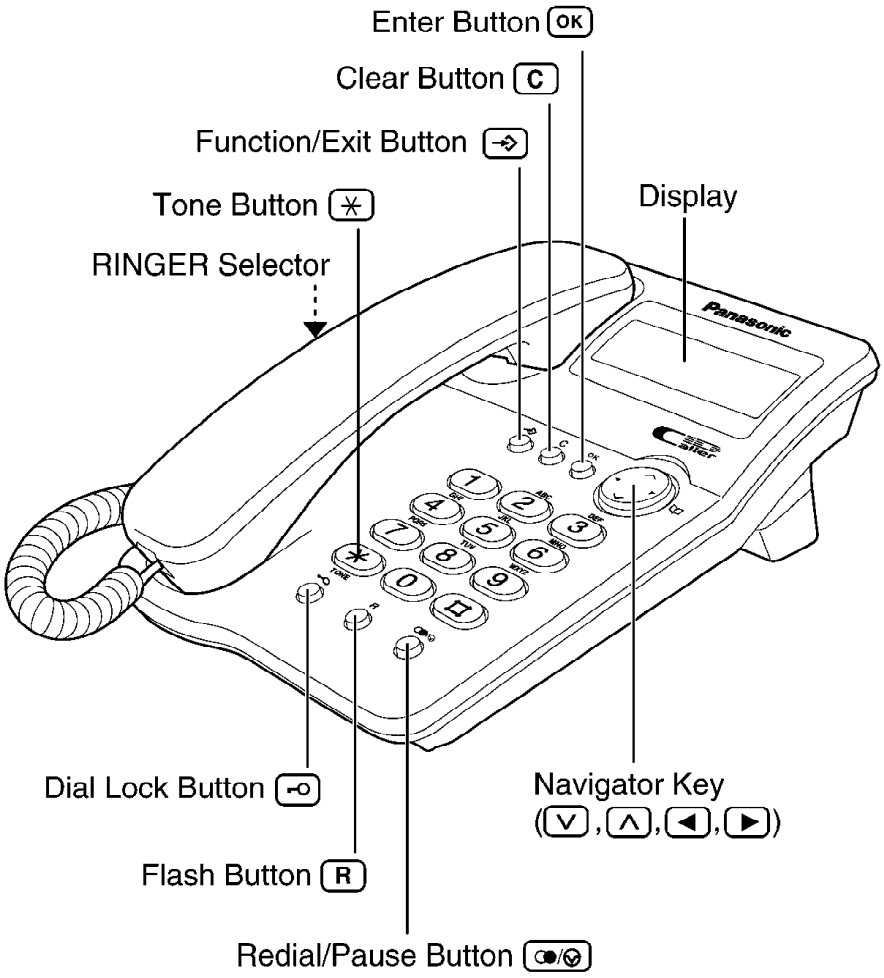
4 Connect the telephone line cord to the unit.

- After the battery replacement, the information stored in the Caller List and the Redial List will be cleared. Store the desired item in the Speed Dial List.
- The time will be shown as "0:00 1/1" or "12:00AM 1/1" after replacing the batteries, readjust the time.

Battery Precautions:
The batteries should be used correctly, otherwise the unit may be damaged by battery leakage.
—Do not mix different types of batteries.
—Do not charge, short-circuit, disassemble, heat or dispose of in fire.
—Remove all the batteries when replacing.

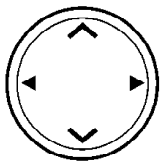
Note:
— If you do not install the batteries or if the battery power is low, the time will be shown as "0:00 1/1" or "12:00AM 1/1". Readjust the time after the battery replacement.
— Replace all the batteries every six months if using Alkaline batteries, or misoperation may occur. (When you use Manganese batteries, replace all of them every three months.)
— Do not use nickel-cadmium batteries.

2. LOCATION OF CONTROLS



How to use the Navigator key

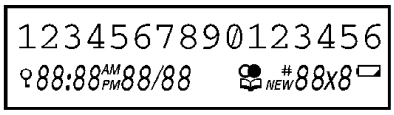
This key has four active areas that are indicated by arrows.



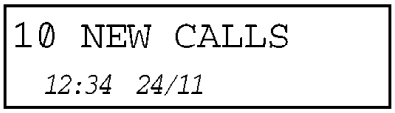
- Pressing the up and down arrows allows you to enter the Caller List and select the function menu, the Caller List and the Speed Dial List. The up and down arrows are also used to adjust the receiver volume.
- Pressing the right and left arrows allows you to enter the Speed Dial List and move the cursor when entering Speed Dial items.

Throughout this Service Manual, the navigator key is indicated by the arrows ▽, △, ◀ or ▶.

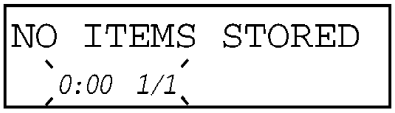
3. DISPLAY



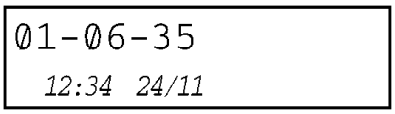
(This display shows all of the possible configurations.)



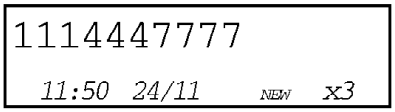
While the unit is not in use, the display shows the current time and date, and the number of new calls.



If the display continuously shows "0:00 1/1" or "12:00AM 1/1", the clock needs adjustment.



During a conversation, the display shows the length of the call (Ex. 1 hour, 6 minutes and 35 seconds).



This is a display from the Caller List. The display shows:
— the caller's number,
— the time and date of the last call (Ex. Nov. 24, 11:50),
— the caller's information is new and has not been viewed ("NEW" is displayed), and
—the number of times called (Ex. 3 times).

: The dial lock mode is set.

: The unit enters in the Speed Dial List.

: [C/⊘] was pressed while the handset is on the cradle.

: This display flashes when the battery power is low. Replace the batteries.

P : [C/⊘] was pressed while dialing or storing phone numbers.

F : [R] was pressed while storing phone numbers.

4. SETTINGS

∗ To Set the Each Settings (4.2. ~ 4.5.) Back to the Factory Default < for Service>

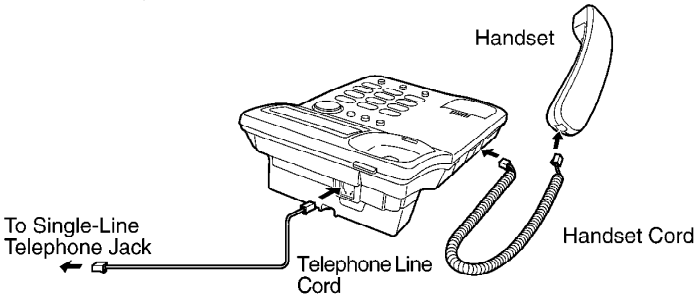
You can set the each settings (4.2. ~ 4.5.) back to the factory default by the following steps.

1) Remove the battery.
2) Press 1 and 9 and # button.
3) Insert the battery with holding above three buttons.
   → LCD turns on all dots.
4) Release the buttons.
   → LCD displays 0123456789 : ; < = 48
   "48" is a check sum of EEPROM.
5) Remove the battery.
6) Insert the battery again.

After this, the set works as a factory preset mode.
If the check sum wasn't "48", that means the internal value of EEPROM had been changed by some accident.

4.1. Connecting the Handset/Telephone Line Cord

After connection, lift the handset to check for a dial tone.



- Use only a Panasonic Handset for the KX-TSC10HGW.
- Use only a telephone line cord included in the unit.
- If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.
- **Telephone line should have additional over voltage and over current protection. Choice of properly fuse should be done by installator.**
- Lightning damage is not covered in the warranty even if lightning protection is installed.

4.2. Dialing Mode

You can select the dialing mode by programming. If you have touch tone service, set to Tone. If rotary or pulse service is used, set to Pulse. Your phone comes from the factory is set to Tone.

Make sure that the handset is on the cradle.

1 Press [→].

```
SAVE SPEED DIAL?
```

2 Scroll to "SET DIAL MODE ?" by pressing [∨] or [∧].

```
SET DIAL MODE ?
```

3 Press [OK].

```
:TONE
```

4 Select "PULSE" or "TONE" by pressing [∨] or [∧].

5 Press [OK].

- The display will return to step 2. To exit the programming mode, press [→] or wait for 60 seconds.

```
STORED
```

- You can exit the programming mode any time by pressing [→].

4.3. Dial Lock

You can prevent others from making a call to any number except dialing by the Speed Dial List (#01, #02 and #03). Once you locked the dialing buttons, even emergency numbers cannot be dialed. Only incoming calls are accepted until the dial lock is canceled.

Before using the Dial Lock or Call Restriction feature, we recommend storing emergency numbers in the memory of the Speed Dial List (#01, #02 or #03). Even if the dialing buttons are locked or the stored numbers are restricted, the numbers stored in these buttons can be dialed.

To set the dial lock

1 Press [-o].
- " ⚲ " flashes on the display.

2 Enter the password.

3 Press [OK].
- " ⚲ " displays.
- If the wrong password was entered, "ERROR" will be displayed, then "– – – –" will be displayed. Enter the correct password.

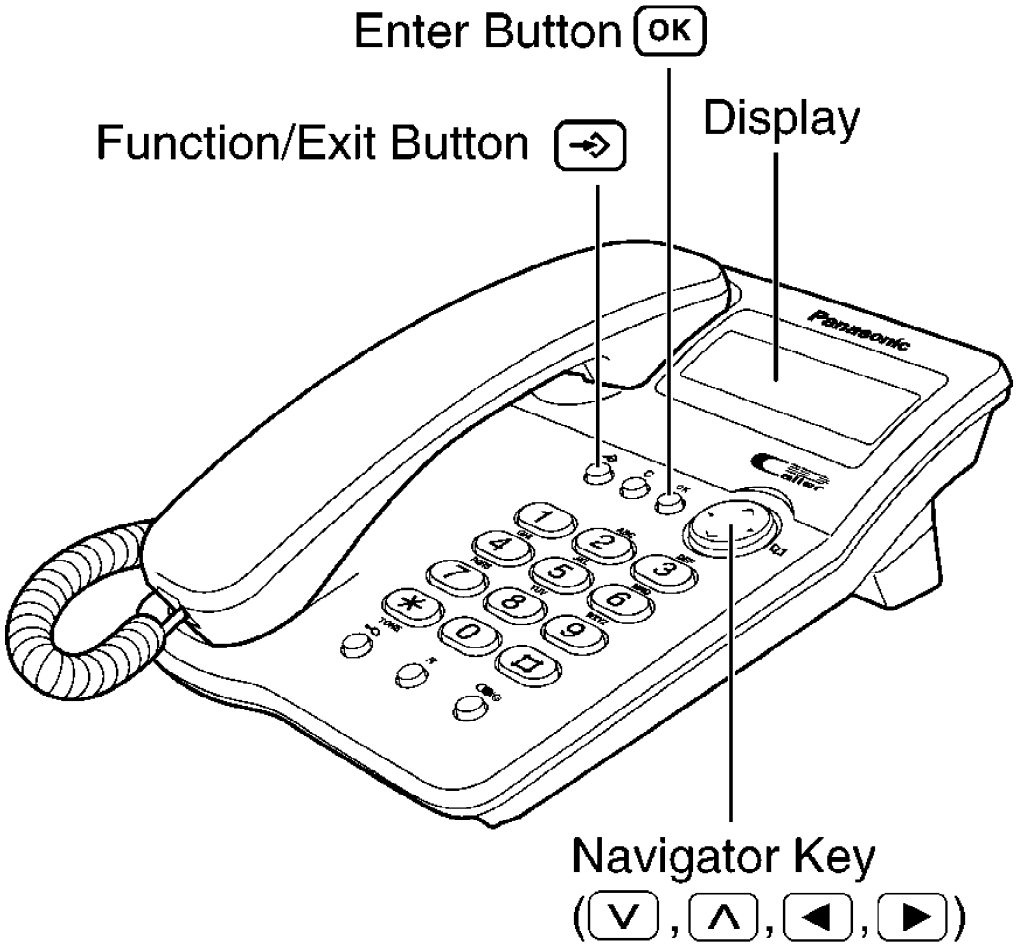
If the dial buttons are pressed after lifting the handset, "DIAL LOCKED" will be displayed.

You can use the following features while the dialing buttons are locked.
- Dialing a number you programmed into the memory of the Speed Dial List (#01, #02 and #03)
- Selecting the ringer volume
- Adjusting the handset volumes
- Programming [except storing/erasing Speed Dial List (#01, #02 and #03)]
- Finding an item in the following lists
  —Caller list
  —Speed dial list
  —Redial list

To cancel the dial lock

Follow the above steps 1 through 3. In step 3, " ⚲" will go out.

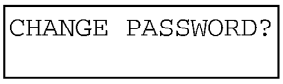
4.4. How to Release the Establishment of Dial Lock



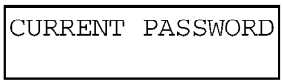
After this procedure, you will be able to establish a new password.
How to release the establishment of dial lock.

1 Press [→]

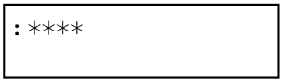
2 Scroll to "CHANGE PASSWORD?" by pressing [∨] or [∧].



3 Press [OK].

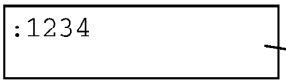


4 Enter "726276642" for initialling of password.



5 Press [OK].
- If the wrong password was entered at step 4,"ERROR" will be displayed, then "----" will be displayed.

6 Enter a new password 4 digits code by dial key pad (ex. "1234").



If you want to set the password for "DIAL LOCK" to "1 1 1 1 "(factory set), you should enter "1 1 1 1".

7 Press [OK].
- The display will return to step 2. To exit the programming mode, press [→] or wait for 60 seconds.

8 To cancel the Dial Lock, follow **To Cancel the Dial Lock** (P.8).

4.5. Call Restriction

You can prevent the unit from dialing phone numbers beginning with specified digit(s) (1 digit or 2 digits). Phone numbers with the restricted leading digits cannot be dialed out.

To set the call restriction

Make sure that the handset is on the cradle.

1 Press [→].

2 Scroll to "CALL RESTRICT ?" by pressing [∨] or [∧].

3 Press [OK].

If you changed the password "1111" (factory set), the display on the right will be shown. Follow below steps 1 and 2.

1. Enter the password.
2. Press [OK]. Go to step 4.

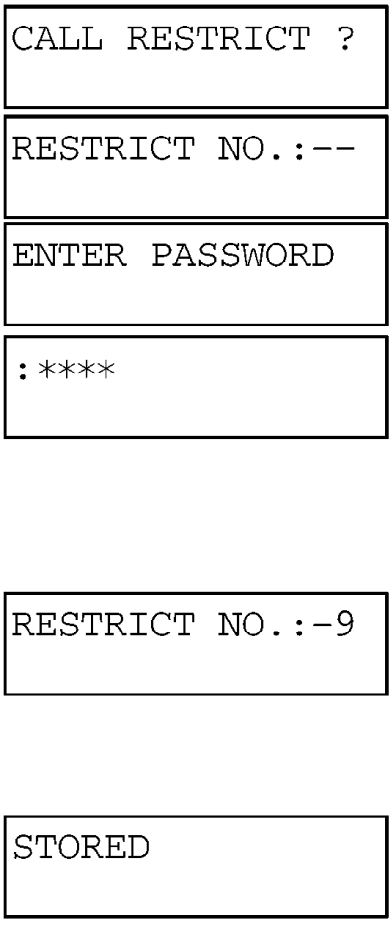
- If the wrong password was entered, "ERROR" will be displayed, then "– – – –" will be displayed. Enter the correct password.

4 Enter the number(s) (1 digit or 2 digits) you want to restrict ([0] to [9]).

- If the wrong number was entered, press [C] and enter the correct number.

5 Press [OK].

- The display will return to step 2. To exit the programming mode, press [→] or wait for 60 seconds.



When dialing a phone number with the restricted leading digit(s), "CALL RESTRICTED" is displayed.

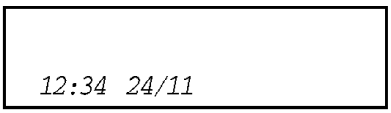
To cancel the call restriction

Follow the above steps 1 through 3. In step 4, press [C] to clear the restricted digits, and press [OK].

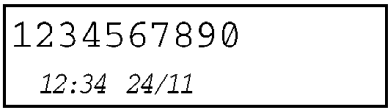
5. OPERATIONS

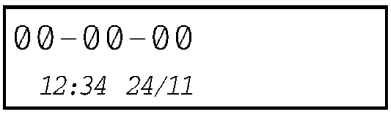
5.1. Making Calls

1 Lift the handset.



2 Dial a phone number.
- The dialed number is displayed.
- After a few seconds, the display will show the length of the call.
- If you misdial, hang up and start again from step 1.





3 When finished talking, hang up.

To redial the last number dialed

Lift the handset → press [C/R].

To redial using the redial list (Memory Redial)

The last 20 phone numbers dialed are stored in the redial list.

1. Press [C/R].
   - The last number dialed and "C●" are displayed.
   - When the dialed number has been stored in the Speed Dialer List, the name is displayed instead of the number. To see the number, press [◀].
2. Select the desired number by pressing [∨] or [∧].
   - You can also select through the list by pressing [C/R].
   - To exit the list, press [→].
3. Lift the handset.
   - The displayed phone number is dialed.

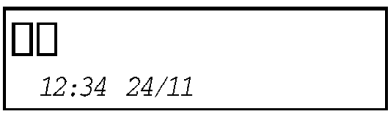
- To erase an item, repeat steps 1 and 2, and press [C].
- If "NO ITEMS STORED" is displayed, the list is empty.

To adjust the handset volume (4 levels) while talking

To increase, press [∧].
To decrease, press [∨].

- The display shows the volume level for a few seconds.

Ex. Handset volume level: 2



5.2. Answering Calls

When a call is received, the unit rings, "INCOMING CALL" is displayed.
If you subscribe to a Caller ID service, the calling party's information will be displayed when the unit is ringing (see below).

1 When the unit rings, lift the handset.

2 When finished talking, hang up.

• When the ringer volume is set to OFF, the unit will not ring.

5.3. FLASH Button

Pressing [R] allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional) such as call waiting.

Selecting the flash time

The flash time depends on your telephone exchange or host PBX. You can select the following flash times: "80, 90, 100, 110, 200, 250, 300, 400, 600, 700 ms (milliseconds)". Your phone comes from the factory set to "100 ms".
Make sure that the handset is on the cradle.

1 Press [→].

2 Scroll to "SET FLASH TIME ?" by pressing [∨] or [∧].

3 Press [OK].

4 Select the desired time by pressing [∨] or [∧].

5 Press [OK].
• The display will return to step 2. To exit the programming mode, press [→] or wait for 60 seconds.

• You can exit the programming mode any time by pressing [→].
• If the unit is connected via a PBX, PBX functions (transferring a call, etc.) might not work correctly. Consult your PBX supplier for the correct setting.

Notes for Service:
The flash time can be back to the default value by talking off the battery and leave the unit for about 3 minutes.

6. DISASSEMBLY INSTRUCTIONS

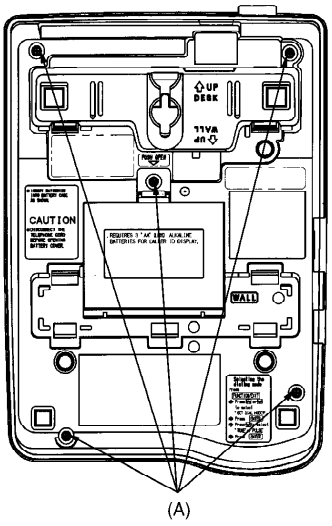


Fig. 1

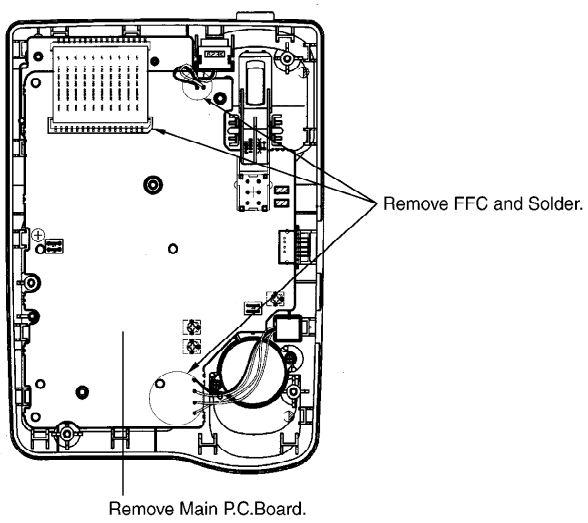


Fig. 2

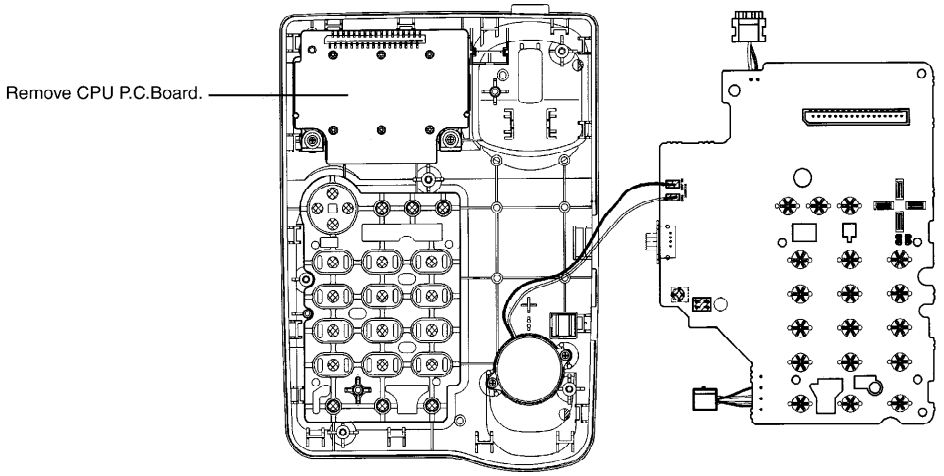


Fig. 3

Shown in Fig —.	To remove —.	Remove —.
1	Lower Cabinet	Screws (2.6 × 12).....(A) × 5
2	Main P.C. Board	FFC and Solder
		Main P.C. Board
3	CPU P.C. Board	CPU P.C. Board

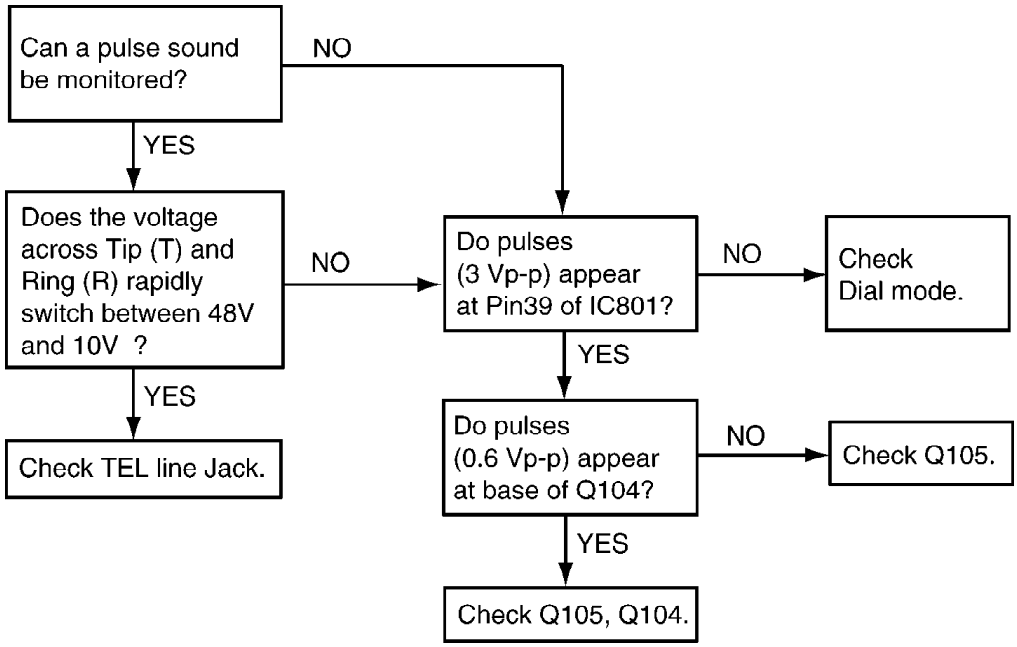
7. TROUBLESHOOTING GUIDE

Make sure batteries are installed for proper operation before troubleshooting.

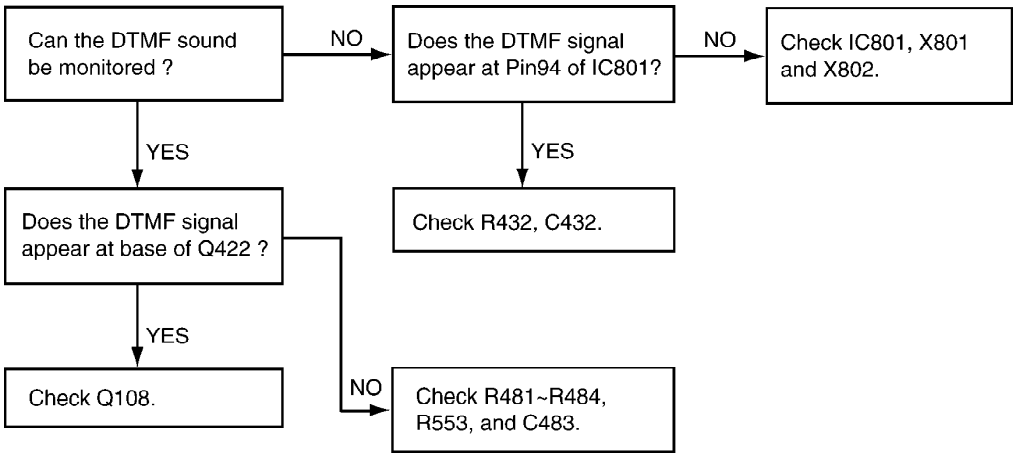
7.1. Service Hints

SYMPTOM	CURE
Dead.	Check IC801, X801, X802.
Can't hear the voice from handset.	Check Q401, Q403, Q404.
No voice transmit.	Check Q422, Q108.
Can't tone dial.	Check IC801(94), R819, R481~R484, R553, C483.
Can't pulse dial.	Check Q105, Q104.
No rings.	Check IC1 and PC1.
Can't speak with the handset.	Check Handset jack.
Can't change the volume for Handset.	Check IC801, Q406~Q408, R407~R409.
No volume handset.	Check Q108, Q422.
Caller ID Function doesn't work.	Check C551, C552, R551, R552, D551~D554, IC801.
Caller ID Function doesn't work. (DTMF)	Check around IC501, Q501, Q502.

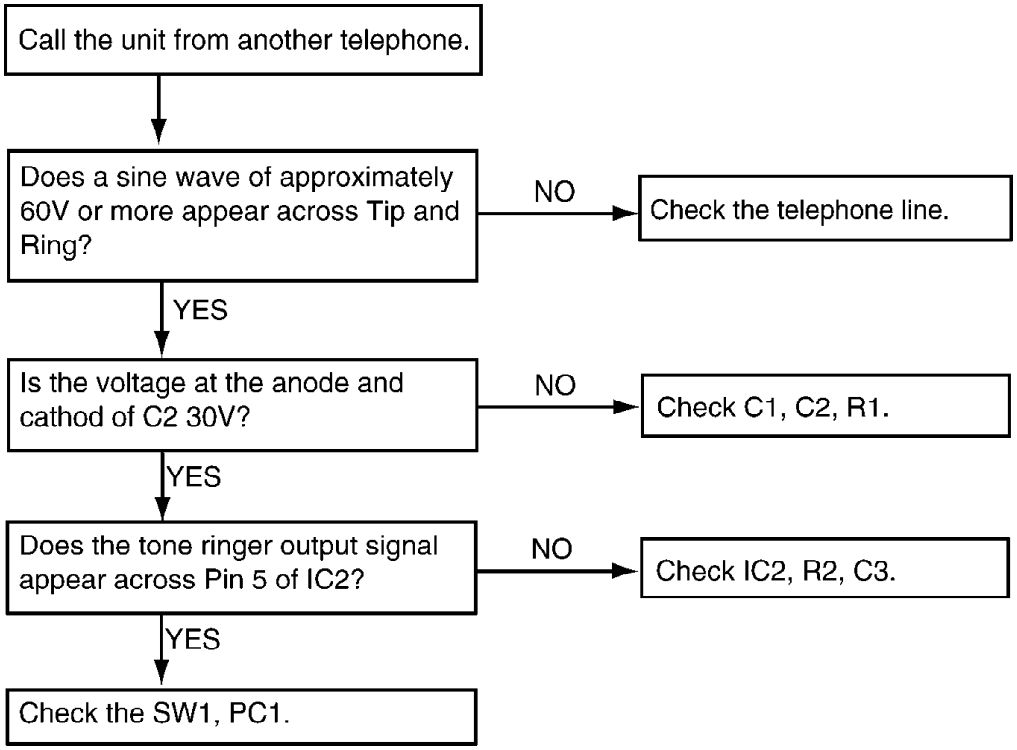
7.2. Pulse Dialing Problems



7.3. Tone Dialing Problems (handset)

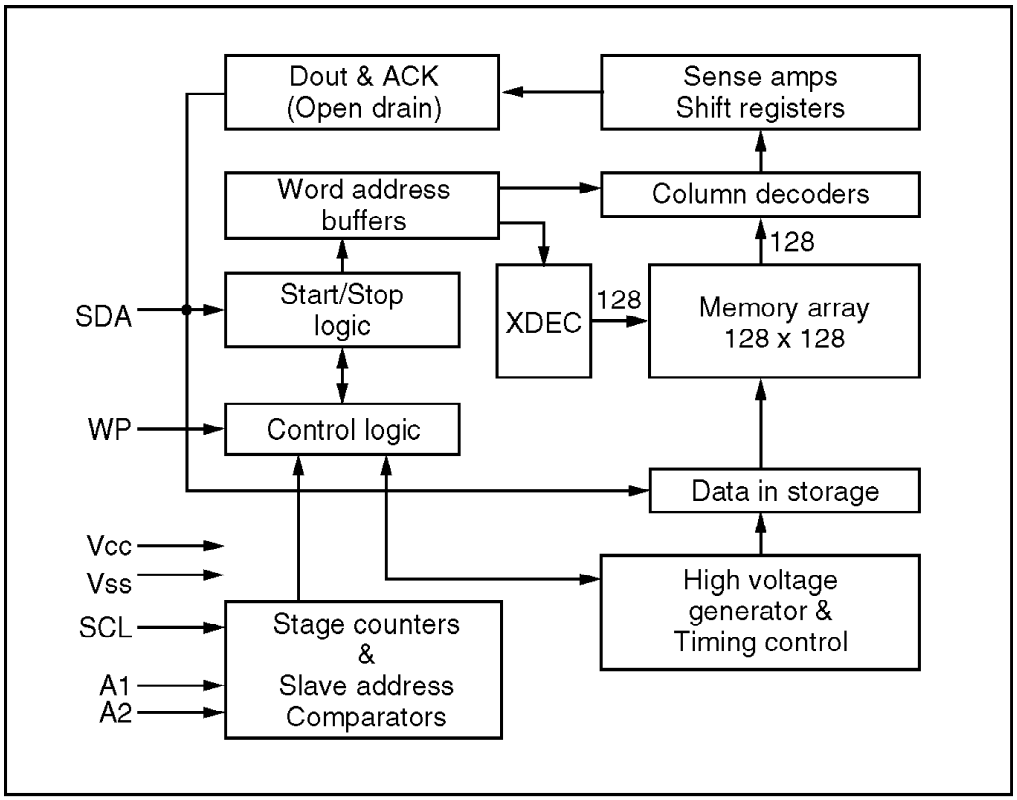


7.4. No Ringing Sound When Ring Signal is Input


Call the unit from another telephone.
Does a sine wave of approximately 60V or more appear across Tip and Ring?
NO
Check the telephone line.
YES
Is the voltage at the anode and cathod of C2 30V?
NO
Check C1, C2, R1.
YES
Does the tone ringer output signal appear across Pin 5 of IC2?
NO
Check IC2, R2, C3.
YES
Check the SW1, PC1.

8. BLOCK DIAGRAM

9. BLOCK DIAGRAM (EEPROM)



10. TERMINAL FUNCTION

1. SCL

SCL terminal is a serial lock input terminal and used for TX/RX control between master and slave.

2. SDA

SDA terminal is an input/output terminal and transfers the address sent from the master device to slave and mutual data. SDA output circuit employs the open drain, therefore the pull-up resistor is requ Terminal ired.

3. A0, A1, A2

The terminals of A0, A1 and A2 are not used.

4. WP

The WP terminal controls writing operation. Reading only is allowed when WP is high, and both reading and writing are allowed when WP is low.

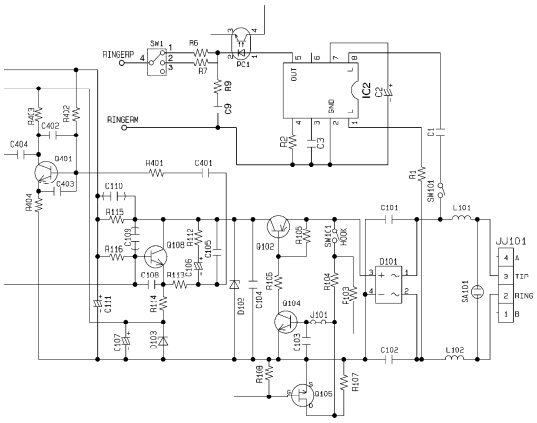
11. CIRCUIT OPERATION

11.1. Bell Detector Circuit

When the bell signal is input between T/R, the signal is outputted at the speaker via the following path:
Tel line → R1/C1 → Pin 1 of IC2/Pin 8 of IC2 → Pin 5 of IC2 → PC1 → SW1 → Ringer

11.2. Line Interface

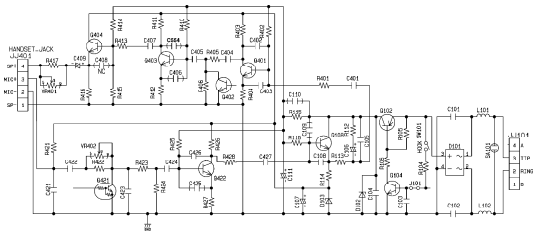
In talk mode, SW101 becomes ON and Q104 base becomes High, causing Q104 and Q102 to turn on and line loop is established.
The loop current flows as follows: D101(+) → Q102 → Q108 → R114 → D103.
The pulse signal that switches ON/OFF is output from pin 39 of the CPU.
Q104 and Q102 switch the line loop ON/OFF, generating the dial pulse signal.



11.3. Telephone Line Interface

11.3.1. Circuit operation

- On hook
Q102 cuts the DC loop current and the voice signal.
- Off hook
Q102 turns on to go into off-hook condition and the following signal flow is for the DC loop current.
T → D101 → Q102 → Q108 → R114 → D103 → D101 → R
- The receiving signal flows:
TEL line → Q102 → C105 → C401 → R401 → Q401 → Q403 → Q404 → Speaker
- The transmission signal flows:
MIC → C422 → R423 → C424 → Q422 → R428 → C427 → Q108 → TEL line



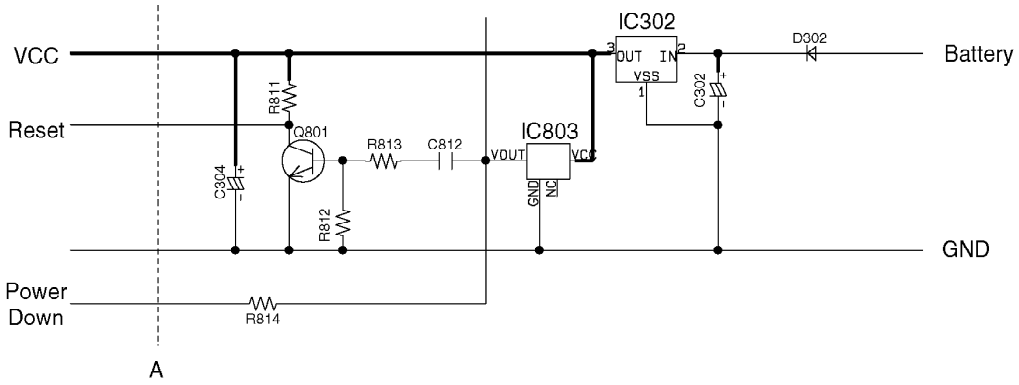
11.4. Initializing Circuit

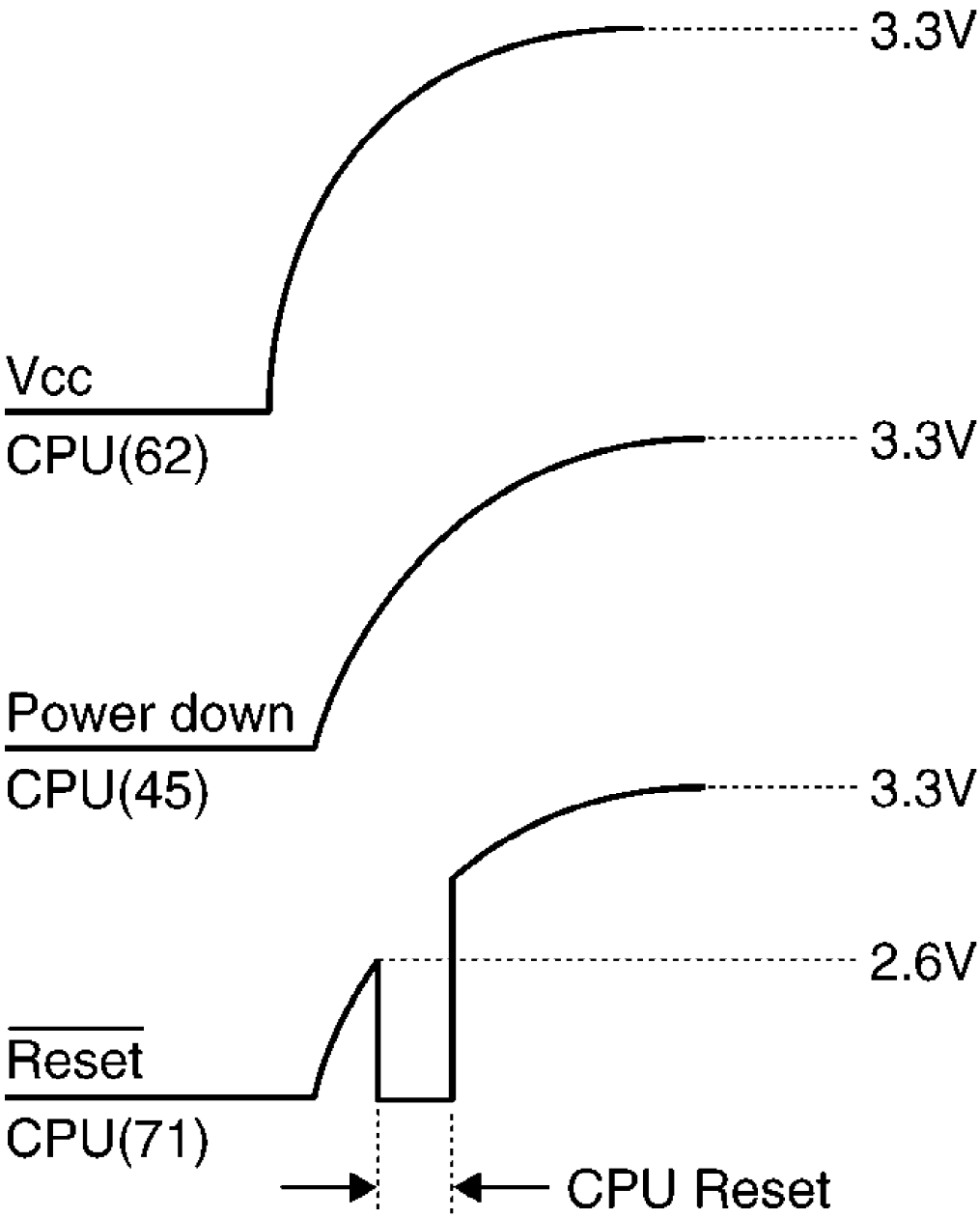
11.4.1. Function:

This circuit is used to initialize the CPU when the batteries are installed.

11.4.2. Circuit operation:

When the batteries are inserted into the unit, the voltage is regulated by IC302 and power is supplied to the CPU.
The unit starts operating soon after the voltage goes beyond the point A in the voltage diagram.





11.5. Caller ID Detect Circuit

11.5.1. Function (FSK signal)

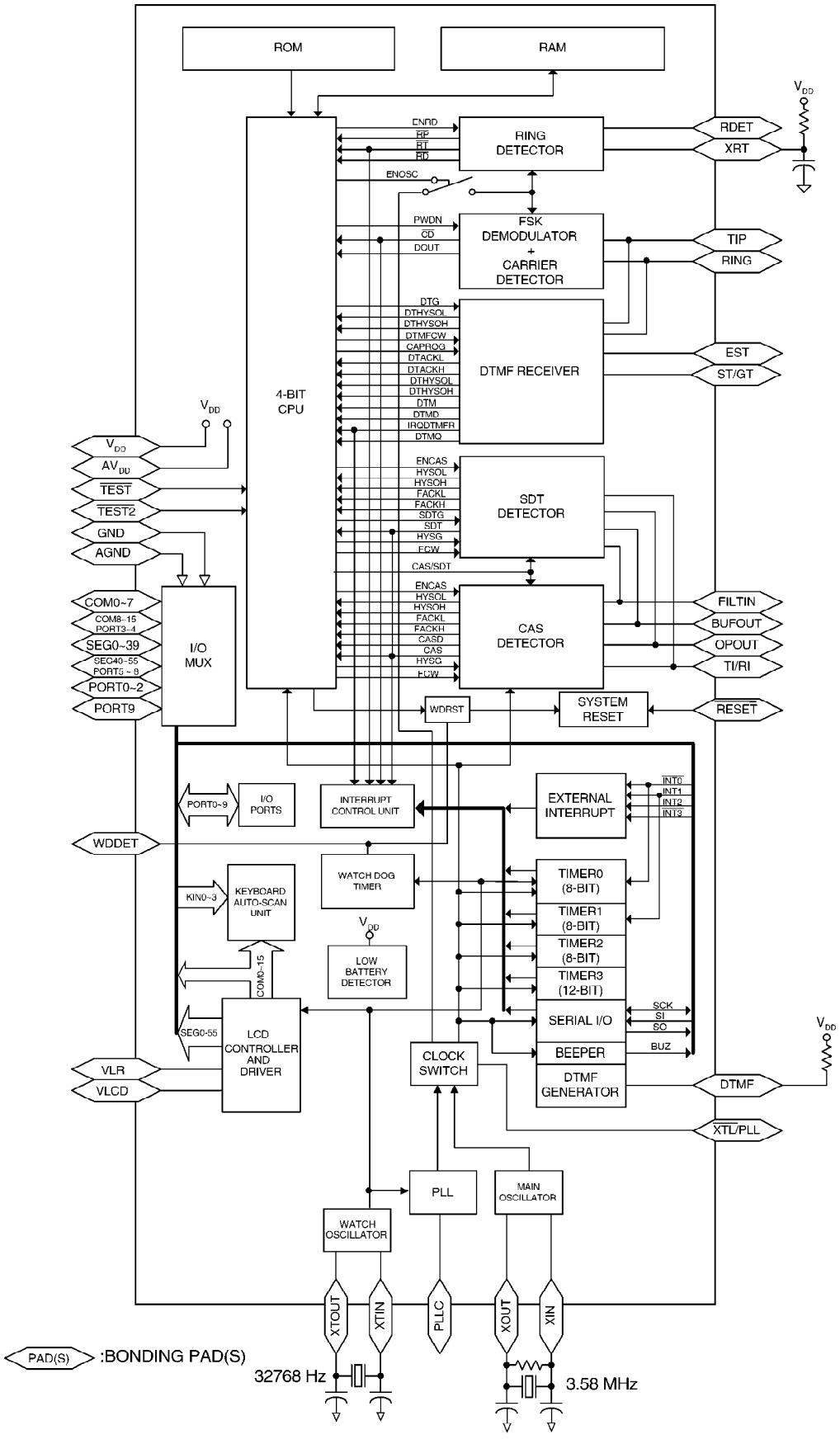
The caller ID is a chargeable ID that the user of telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal.
The data from the telephone exchange is modem signal and modulated in FSK (Frequency Shift Keying) format. Data 0 is 1200Hz sine wave, and data 1 is 2200Hz sine wave. There are two types of message format: the single message format and plural message format. The plural message format allows transmitting the name and data code information in addition to the time and telephone number data.

11.5.2. Circuit operation:

Caller ID
Caller ID signal is sent through the following path:
TEL Line → C551,C552 → R551,R552 → Pin 87,88 of IC801

12. BLOCK DIAGRAM

12.1. IC801

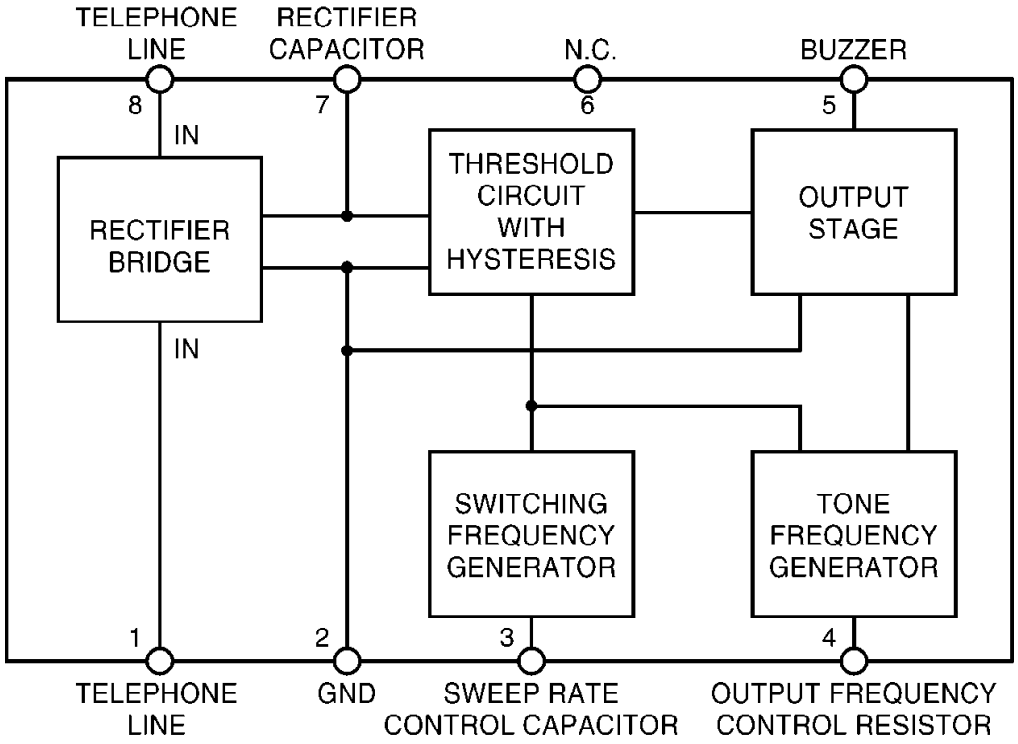

ROM
RAM
4-BIT CPU
RING DETECTOR
ENOSC
FSK DEMODULATOR + CARRIER DETECTOR
DTMF RECEIVER
SDT DETECTOR
CAS DETECTOR
I/O MUX
WDRST
SYSTEM RESET
I/O PORTS
INTERRUPT CONTROL UNIT
EXTERNAL INTERRUPT
WATCH DOG TIMER
KEYBOARD AUTO-SCAN UNIT
LOW BATTERY DETECTOR
LCD CONTROLLER AND DRIVER
TIMER0 (8-BIT)
TIMER1 (8-BIT)
TIMER2 (8-BIT)
TIMER3 (12-BIT)
SERIAL I/O
BEEPER
DTMF GENERATOR
CLOCK SWITCH
PLL
MAIN OSCILLATOR
WATCH OSCILLATOR
RDET
XRT
TIP
RING
EST
ST/GT
FILTIN
BUFOUT
OPOUT
TI/RI
RESET
DTMF
XTL/PLL
WDDET
VLR
VLCD
PAD(S) :BONDING PAD(S)
32768 Hz
3.58 MHz

12.2. CPU DATA (IC801)

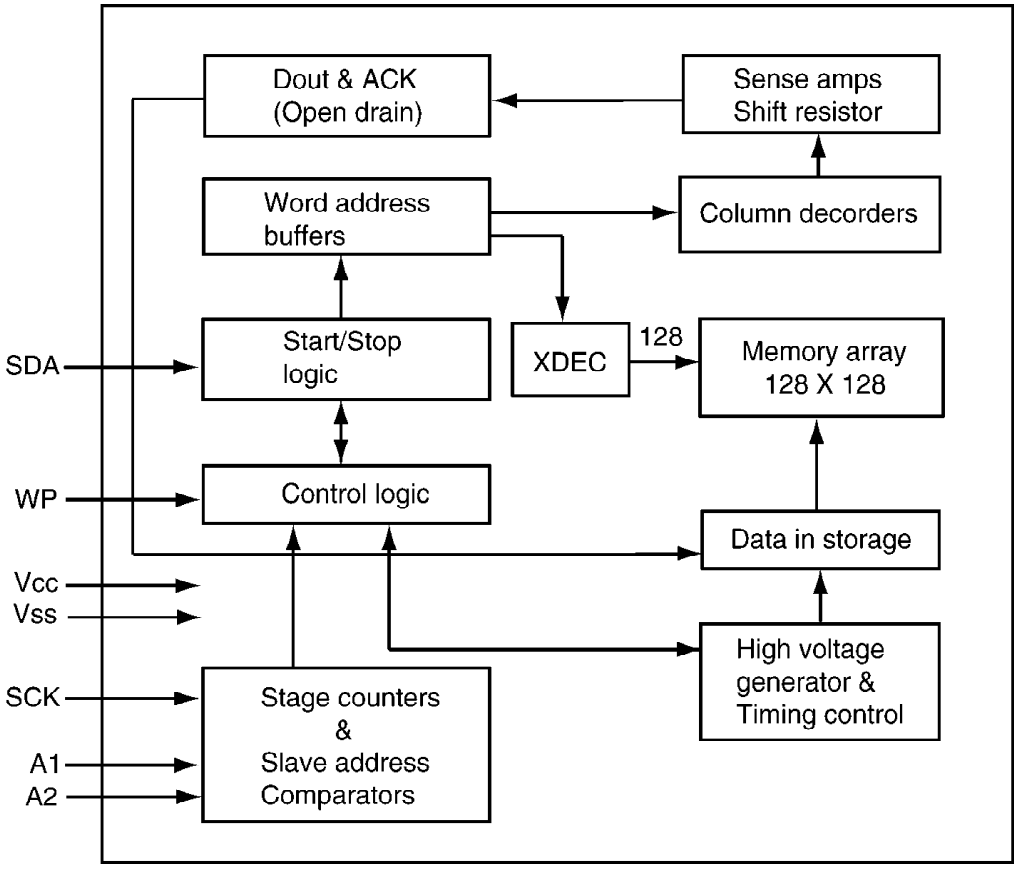
Pin	Description	I/O	High	Hi-z	Low
1	SEG15	O		-	-
2	SEG16	O	-	-	-
3	SEG17	O	-	-	-
4	SEG18	O	-	-	-
5	SEG19	O	-	-	-
6	SEG20	O	-	-	-
7	SEG21	O	-	-	-
8	NC	-	-	-	-
9	SEG22	O	-	-	-
10	SEG23	O	-	-	-
11	SEG24	O	-	-	-
12	SEG25	O	-	-	-
13	SEG26	O	-	-	-
14	SEG27	O	-	-	-
15	SEG28	O	-	-	-
16	NC	-	-	-	-
17	SEG29	O	-	-	-
18	SEG30	O	-	-	-
19	SEG31	O	-	-	-
20	SEG32	O	-	-	-
21	SEG33	O	-	-	-
22	SEG34	O	-	-	-
23	SEG35	O	-	-	-
24	NC	-	-	-	-
25	SEG36	O	-		-
26	SEG37	O	-	-	-
27	SEG38	O	-	-	-
28	SEG39	O	-	-	-
29	SEG56	O	-	-	-
30	SEG57	O	-	-	-
31	SEG58	O	-	-	-
32	NC	-	-	-	-
33	SEG59	O	-	-	-
34	PULSE MUTE	O	ON	-	OFF
35	Volume1	O	Active	-	NORMAL
36	Volume2	O	Active	-	NORMAL
37	Volume3	O	Active	-	NORMAL
38	STB1	O	Active	-	NORMAL
39	PULSE	O	MAKE	-	BREAK
40	EEPROM_CS	O	OFF	-	ON
41	STB2	O	Active	-	NORMAL
42	BATT_LOW	I	NORMAL	-	Active
43	LINE DET1	I	NORMAL	-	-
44	INUSE	I	NORMAL	-	INUSE
45	STOP	I	STOP	-	NORMAL
46	TX_MUTE	O	MUTE ON	-	MUTE OFF
47	RX_MUTE	O	MUTE ON	-	MUTE OFF
48	STB7	O	NORMAL	-	Active
49	STB8	O	NORMAL	-	Active
50	STB3	O	-	NORMAL	Active
51	STB4	O	-	NORMAL	Active
52	KIN4	I	OFF	-	KEY IN
53	KIN3	I	OFF	-	KEY IN
54	KIN2	I	OFF	-	KEY IN
55	KIN1	I	OFF	-	KEY IN
56	EST	O		-	
57	ST/GT	O		-	
58	PLLC	I		-	
59	XTL/PLL	I	-	-	(XTL)
60	VLR	I	-	-	(GND)
61	VLCD	I	(VDD)	-	-
62	VDD	-	-	-	-
63	VDD	-	-		-
64	TEST2	I	(VDD)		-

Pin	Description	I/O	High	Hi-z	Low
65	NC	-	-	-	-
66	XOUT	O	-	-	-
67	XIN	I	-	-	-
68	TEST	I			
69	XTOUT	O	-	-	-
70	XTIN	I	-	-	-
71	RESET	I	NORMAL		RESET
72	SCK	O			
73	NC	-	-	-	-
74	STB5	O	Active	-	NORMAL
75	STB6	O	Active	-	NORMAL
76	BEEP	O	Active	-	NORMAL
77	HOOK_DET	I	ON HOOK		OFF HOOK
78	FSK/DTMF	I	NORMAL		Active
79	EEPROM_SDA	I/O	ACK NG		ACK OK
80	BATT.OUT	I	NORMAL		BATT.OUT
81	NC	-	-	-	-
82	OPOUT	O			
83	TI/RI	I			
84	BUFOUT	O			
85	FILTIN	I			
86	AVDD	-	-	-	-
87	TIP	I			
88	RING	I			
89	AGND	-	-	-	-
90	NC	-	-	-	-
91	NC	-	-	-	-
92	RDET	I			
93	XRT	O			
94	DTMF	O			
95	WDDET	I			
96	GND	-	-	-	-
97	GND	-	-	-	-
98	COM15	O	-	-	-
99	COM14	O	-	-	-
100	COM13	O	-	-	
101	COM12	O	-	-	-
102	COM11	O	-	-	-
103	COM10	O	-	-	-
104	COM9	O	-	-	-
105	COM8	O	-	-	-
106	COM7	O	-	-	-
107	COM6	O	-	-	-
108	COM5	O	-	-	-
109	COM4	O	-	-	-
110	COM3	O	-	-	-
111	COM2	O	-	-	-
112	COM1	O	-	-	-
113	COM0	O	-	-	-
114	SEG0	O	-	-	-
115	SEG1	O	-	-	-
116	SEG2	O	-	-	-
117	SEG3	O	-	-	-
118	SEG4	O	-	-	-
119	SEG5	O	-	-	-
120	SEG6	O	-	-	-
121	SEG7	O	-	-	-
122	SEG8	O	-	-	-
123	SEG9	O	-	-	-
124	SEG10	O	-	-	-
125	SEG11	O	-	-	-
126	SEG12	O	-	-	-
127	SEG13	O	-	-	-
128	SEG14	O	-	-	-

12.3. RINGER IC (IC2)



12.4. EEPROM (IC802)



1. SCK

SCK terminal is input terminal of Serial Clock to control transmit and receipt between Master and Slave.

2. SDA

SDA terminal is input terminal, to forward the address and the mutual data between Master Device and Slave Device the mutual. This terminal needs the pull-up resistance external because output circuit of SDA uses Open Drain.

3. A0, A1, A2

A0, A1, and A2 terminal is not used.

4. WP

WP terminal controls writing action. It is possible to do only reading action when high level input and it is possible to do reading and writing action when low level input.

13. HOW TO REPLACE A FLAT PACKAGE IC

13.1. Preparation

- SOLDER

Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

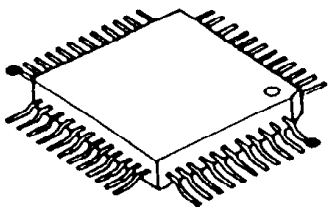
Recommended power consumption will be between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
(An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

- Flux

HI115 Specific gravity 0.863.
(Original flux will be replaced daily.)

13.2. Procedure

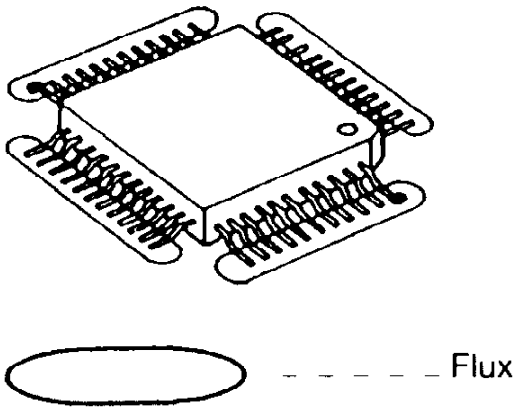
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



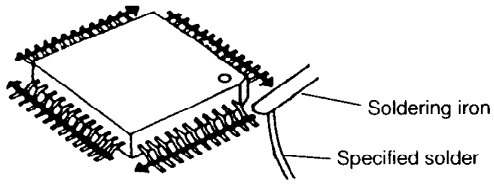
● – – – – – –Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB

2. Apply flux to all of the pins on the IC.



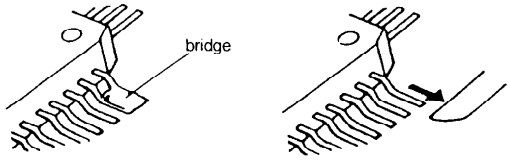
3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.



13.3. Removing Solder from Between Pins

1. Add a small amount of solder to the bridged pins.

2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



14. TERMINAL GUIDE OF THE ICs, TRANSISTORS AND DIODES

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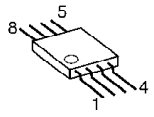
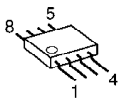
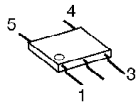
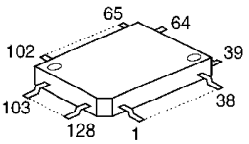
<td> 

PQVINJU7014R</td>
<td> 

PQWITSC10HG</td>
<td> 

C0CBABE00023
PQVIPS3238NT</td>
<td> 

C2ABFG000003</td>
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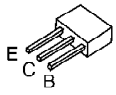
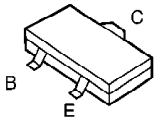
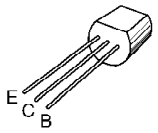
<td> 

2SK1398</td>
<td colspan="2"> 

2SD1819A, UN5213, PQVTFB1A4M,
PQVTDTC144TU, 2SB1218A</td>
<td> 

PQVT2N6517CA,
B1AAJC000010,
2SA1625, 2SA933</td>
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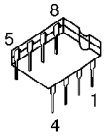
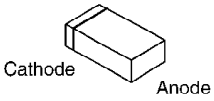
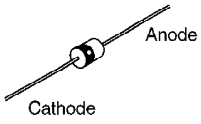
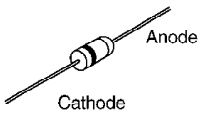
<td> 

PQVILS1240A</td>
<td> 

MA111</td>
<td> 

MA165, MA700A</td>
<td> 

MA4180</td>
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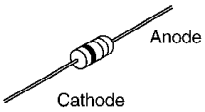
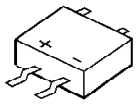
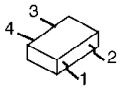
<td> 

MA4033</td>
<td> 

PQVDS1YB60F1</td>
<td> 

PQVIPS3325UT</td>
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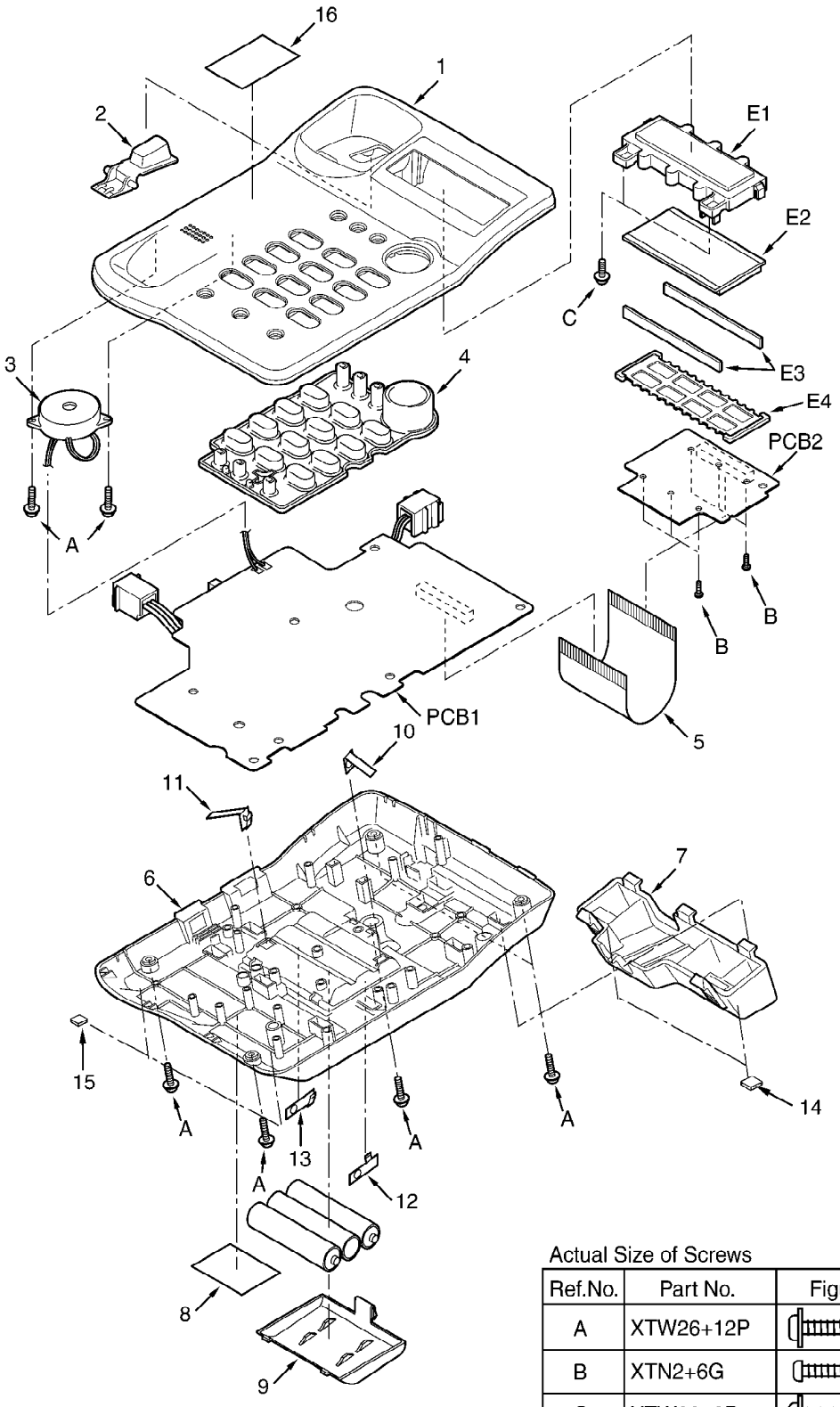
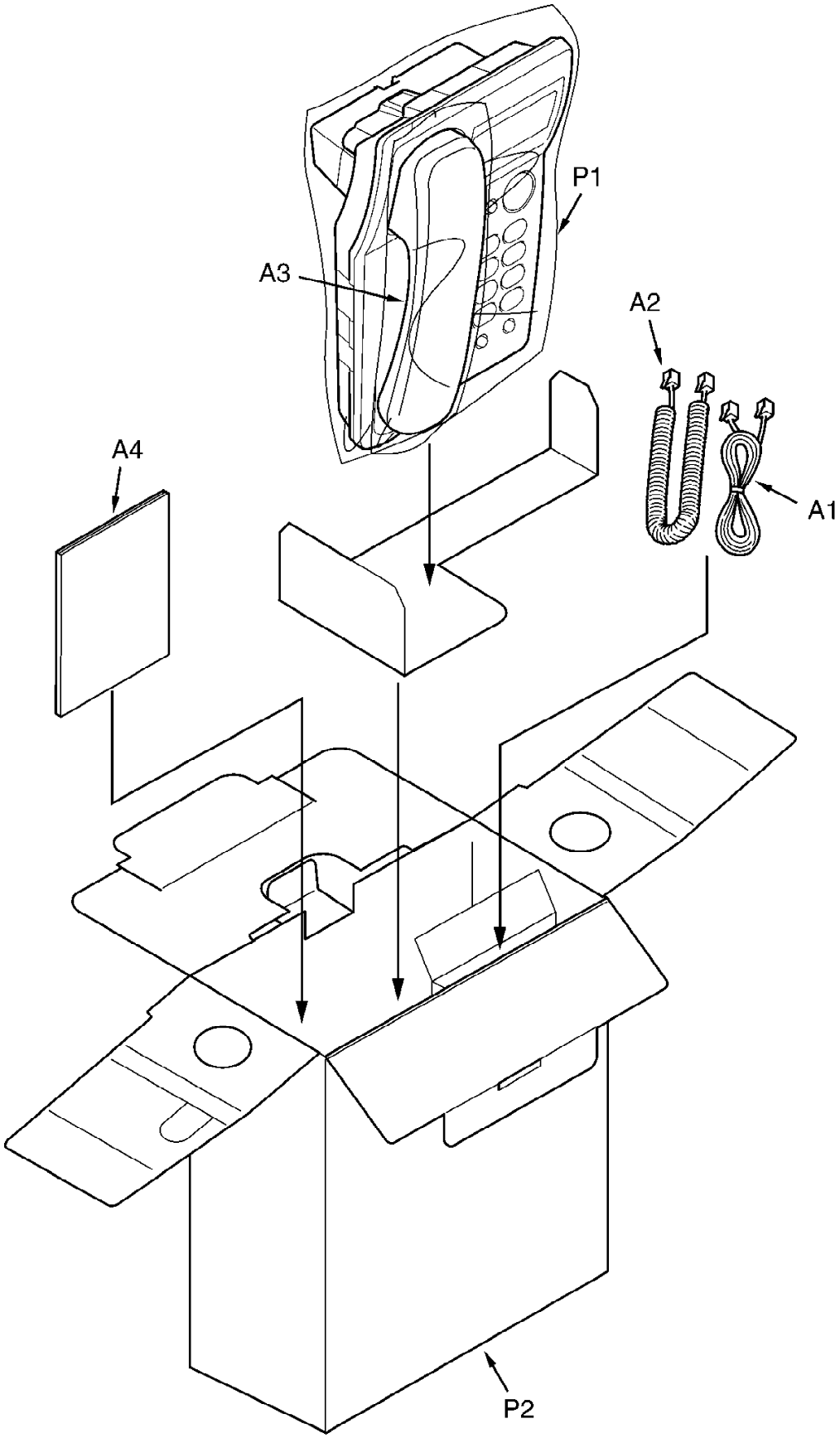
15. CABINET AND ELECTRICAL PARTS



Actual Size of Screws

Ref.No.	Part No.	Figure
A	XTW26+12P	
B	XTN2+6G	
C	XTW26+8P	

16. ACCESSORIES AND PACKING MATERIALS


P1
A3
A2
A4
A1
P2

17. REPLACEMENT PARTS LIST

Notes:

1. **RTL (Retention Time Limited)**
   The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing parts and product retention.
   After the end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by the ⚠ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.
3. **The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.**
4. **ISO code (example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.**
5. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   ***Type & Wattage of Resistor**

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

17.1. Unit

17.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQKM10569V1	CABINET BODY	PS-HB
2	PQBH10033Z1	BUTTON, HOOK	ABS-HB
3	L0DDFD000002	BUZZER	
4	PQSX10218X	KEYBOARD SWITCH, 19 KEY	
5	PQJE10124Z	CONNECTOR, FFC	
6	PQKF10572W1	CABINET COVER	PS-HB
7	PQKL10047Z1	STAND, WALL MOUNT	ABS-HB
8	PQGT15626Z	NAME PLATE	
9	PQKK10105X1	LID, BATTERY	ABS-HB
10	PQJC10044Z	BATTERY TERMINAL (+)	
11	PQJC10045Z	BATTERY TERMINAL (-)	
12	PQJC313Z	BATTERY TERMINAL (+) (-)	
13	PQJC314Z	BATTERY TERMINAL (-) (+)	
14	PQHA10017Z	RUBBER PARTS, LEG CUSHION	
15	PQHA10018Z	RUBBER PARTS, FOOT	
16	PQQT22554Z	LABEL, CAUTION	

17.1.2. Main P.C. Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1TSC10HG	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC2	PQVILS1240A	IC	
IC301	PQVIPS3238NT	IC	S
IC302	C0CBABE00023	IC	
IC501	PQVINJU7014R	IC	
		(TRANSISTORS)	
Q102	2SA1625	TRANSISTOR(SI)	S
Q104	PQVT2N6517CA	TRANSISTOR(SI)	S
Q105	2SK1398	TRANSISTOR(SI)	S
Q106	2SA933	TRANSISTOR(SI)	S
Q107	2SD1819A	TRANSISTOR(SI)	
Q108	B1AAJC000010	TRANSISTOR(SI)	
Q110	2SD1819A	TRANSISTOR(SI)	
Q111	2SD1819A	TRANSISTOR(SI)	
Q401	2SD1819A	TRANSISTOR(SI)	
Q402	2SD1819A	TRANSISTOR(SI)	
Q403	2SD1819A	TRANSISTOR(SI)	
Q404	2SD1819A	TRANSISTOR(SI)	
Q406	UN5213	TRANSISTOR(SI)	S
Q407	UN5213	TRANSISTOR(SI)	S
Q408	UN5213	TRANSISTOR(SI)	S
Q421	PQVTFB1A4M	TRANSISTOR(SI)	S
Q422	2SD1819A	TRANSISTOR(SI)	
Q481	2SD1819A	TRANSISTOR(SI)	
Q501	2SB1218A	TRANSISTOR(SI)	
Q502	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D101	PQVDS1YB60F1	DIODE(SI)	S

Ref. No.	Part No.	Part Name & Description	Remarks
D102	MA4180	DIODE(SI)	
D103	MA4033	DIODE(SI)	
D104	MA4180	DIODE(SI)	
D301	MA165	DIODE(SI)	
D302	MA165	DIODE(SI)	
D303	MA700A	DIODE(SI)	
D501	MA111	DIODE(SI)	
D502	MA111	DIODE(SI)	
D503	MA111	DIODE(SI)	
D504	MA111	DIODE(SI)	
D506	MA111	DIODE(SI)	
D551	MA111	DIODE(SI)	
D552	MA111	DIODE(SI)	
D553	MA111	DIODE(SI)	
D554	MA111	DIODE(SI)	
D907	MA111	DIODE(SI)	
		(COILS)	
L101	ELEV101KA	COIL	
L102	ELEV101KA	COIL	
		(CONNECTOR & JACKS)	
CN202	PQJS34X54Z	CONNECTOR, 34P	S
JJ101	PQJJ1T029Z	JACK, MODULAR	
JJ401	PQJJ1T030Z	JACK, HANDSET	
		(SWITCHES)	
SW1	PQSS3A17W	SLIDE SWITCH	
SW101_1	PQSH2B105Z	SWITCH, HOOK	
		(VARIABLE RESISTORS)	
VR401	PQNVZ6TLTB13	VARIABLE RESISTOR	S
VR402	EVNDXAA03B25	VARIABLE RESISTOR	
VR481	EVNDXAA03B55	VARIABLE RESISTOR	
		(RESISTORS)	
R1	ERDS1VJ392	3.9k	
R2	ERJ3GEYJ223	22k	
R6	ERJ3GEYJ102	1k	
R7	ERJ3GEYJ103	10k	
R9	ERJ3GEYJ103	10k	
R103	PQ4R10XJ474	470k	S
R104	PQ4R10XJ394	390k	S
R105	ERJ3GEYJ104	100k	
R106	ERDS2TJ332	3.3k	
R107	ERJ3GEYJ105	1M	
R108	ERJ3GEYJ155	1.5M	
R109	ERJ3GEYJ104	100k	
R110	ERJ3GEYJ472	4.7k	
R111	ERJ3GEYJ103	10k	
R112	ERJ3GEYJ152	1.5k	
R113	ERJ3GEYJ560	56	
R114	ERDS1TJ150	15	S
R115	ERJ3GEYJ122	1.2k	
R116	ERJ3GEYJ562	5.6k	
R119	ERJ3GEY0R00	0	
R121	PQ4R10XJ825	8.2M	S
R122	PQ4R10XJ335	3.3M	S
R123	ERJ3GEYJ105	1M	

Ref. No.	Part No.	Part Name & Description	Remarks
R126	ERJ3GEYJ104	100k	
R127	ERJ3GEYJ104	100k	
R301	ERJ3GEYJ105	1M	
R302	ERJ3GEYJ475	4.7M	
R303	ERJ3GEYJ105	1M	
R304	ERJ3GEYJ475	4.7M	
R401	ERJ3GEYJ103	10k	
R402	ERJ3GEYJ475	4.7M	
R403	ERJ3GEYJ392	3.9k	
R404	ERJ3GEYJ560	56	
R405	ERJ3GEYJ333	33k	
R406	ERJ3GEYJ224	220k	
R407	ERJ3GEYJ393	39k	
R408	ERJ3GEYJ153	15k	
R409	ERJ3GEYJ103	10k	
R410	ERJ3GEYJ335	3.3M	
R411	ERJ3GEYJ272	2.7k	
R412	ERJ3GEYJ151	150	
R413	ERJ3GEYJ183	18k	
R414	ERJ3GEYJ394	390k	
R415	ERJ3GEYJ683	68k	
R416	ERJ3GEYJ561	560	
R420	ERJ3GEYJ101	100	
R421	ERJ3GEYJ272	2.7k	
R423	ERJ3GEYJ103	10k	
R424	ERJ3GEYJ224	220k	
R425	ERJ3GEYJ335	3.3M	
R426	ERJ3GEYJ332	3.3k	
R427	ERJ3GEYJ560	56	
R428	ERJ3GEYJ152	1.5k	
R431	ERJ3GEYJ335	3.3M	
R432	ERJ3GEYJ474	470k	
R482	ERJ3GEYJ273	27k	
R484	ERJ3GEYJ224	220k	
R485	ERJ3GEYJ103	10k	
R486	ERJ3GEYJ103	10k	
R501	PQ4R10XJ334	330k	S
R502	PQ4R10XJ334	330k	S
R503	ERJ3GEYJ474	470k	
R504	ERJ3GEYJ474	470k	
R505	ERJ3GEYJ334	330k	
R506	ERJ3GEYJ222	2.2k	
R507	ERJ3GEYJ334	330k	
R508	ERJ3GEYJ335	3.3M	
R509	ERJ3GEYJ273	27k	
R510	ERJ3GEYJ394	390k	
R511	ERJ3GEYJ105	1M	
R512	ERJ3GEYJ104	100k	
R513	ERJ3GEYJ105	1M	
R514	ERJ3GEYJ473	47k	
R515	ERJ3GEYJ103	10k	
R516	ERJ3GEYJ224	220k	
R517	ERJ3GEYJ105	1M	
R551	PQ4R10XJ104	100k	S

Ref. No.	Part No.	Part Name & Description	Remarks
R552	PQ4R10XJ104	100k	S
R553	ERJ3GEYJ223	22k	
R555	ERJ3GEYJ104	100k	
J5	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	ECQE2E474KZ	0.47	S
C2	ECEA1HKS100	10	S
C3	ECUV1C563KBV	0.056	
C9	ECUV1H103KBV	0.01	
C101	ECKD2H681KB	680p	S
C102	ECKD2H681KB	680p	S
C103	ECUV1H103KBV	0.01	
C104	ECUV1H103KBV	0.01	
C105	ECUV1H103KBV	0.01	
C106	ECEA1CKA470	47	
C107	ECEA0JKA221	220	
C108	ECUV1H102KBV	0.001	
C111	ECEA1CKS220	22	S
C115	ECUV1H103KBV	0.01	
C301	ECUV1C104KBV	0.1	
C302	ECEA0JWA102	1000	
C303	ECUV1C104KBV	0.1	
C304	ECEA1AU221	220	S
C401	ECUV1C104KBV	0.1	
C402	ECUV1H391JCV	390p	S
C403	ECUV1H102KBV	0.001	
C404	ECUV1C104KBV	0.1	
C405	ECUV1C104KBV	0.1	
C407	ECUV1C104KBV	0.1	
C409	ECEA1CKA100	10	
C420	ECEA1AKS330	33	S
C421	ECUV1H333KBV	0.033	S
C422	ECUV1H103KBV	0.01	
C423	ECUV1H102KBV	0.001	
C424	ECUV1H103KBV	0.01	
C425	ECUV1H102KBV	0.001	
C426	ECUV1H151JCV	150p	
C427	ECUV1C104KBV	0.1	
C431	ECUV1H103KBV	0.01	
C432	ECUV1H103KBV	0.01	
C481	ECUV1H102KBV	0.001	
C482	ECUV1H391JCV	390p	S
C483	ECUV1H151JCV	150p	
C501	ECKT2H152KB	0.0015	S
C502	ECKT2H152KB	0.0015	S
C503	ECUV1H471JCV	470p	S
C504	ECUV1H471JCV	470p	S
C505	ECUV1H680JCV	68p	
C506	ECUV1H222KBV	0.0022	
C507	ECUV1C104KBV	0.1	
C508	ECUV1C104KBV	0.1	
C509	ECUV1C104KBV	0.1	
C520	ECUV1H103KBV	0.01	
C551	ECUV1H103KBV	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C552	ECUV1H103KBV	0.01	
C555	ECUV1H221JCV	220p	S
		(OTHERS)	
PC1	0N3181	PHOTO COUPLER	
SA101	PQVDDSS301L	VARISTOR (SURGE ABSORBER)	S

17.1.3. CPU P.C. Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQWP2TSC10HG	CPU P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC801	C2ABFG000003	IC	
IC802	PQWITSC10HG	IC	
IC803	PQVIPS3325UT	IC	
		(TRANSISTORS)	
Q801	2SD1819A	TRANSISTOR(SI)	
Q802	PQVTDTC144TU	TRANSISTOR(SI)	S
		(DIODE)	
D801	MA111	DIODE(SI)	
		(CRYSTAL OSCILLATORS)	
X801	PQVCL3276N6Z	CRYSTAL OSCILLATOR	S
X802	PQVBZTA3.58M	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R801	ERJ3GEYJ474	470k	
R803	ERJ3GEY0R00	0	
R805	ERJ3GEYJ394	390k	
R806	ERJ3GEYJ104	100k	
R807	ERJ3GEYJ104	100k	
R808	ERJ3GEYJ104	100k	
R810	ERJ3GEYJ105	1M	
R811	ERJ3GEYJ104	100k	
R812	ERJ3GEYJ104	100k	
R813	ERJ3GEYJ223	22k	
R814	ERJ3GEYJ104	100k	
R819	ERJ3GEYJ683	68k	
R821	ERJ3GEYJ224	220k	
R822	ERJ3GEY0R00	0	
R824	ERJ3GEYJ474	470k	
R830	ERJ3GEYJ332	3.3k	
R831	ERJ3GEYJ332	3.3k	
R832	ERJ3GEYJ332	3.3k	
R833	ERJ3GEYJ332	3.3k	
		(CAPACITORS)	
C801	ECUV1H103KBV	0.01	
C802	ECUV1C104KBV	0.1	
C804	ECUV1H103KBV	0.01	
C805	ECUV1H101JCV	100p	
C806	ECUV1H220JCV	22p	
C807	ECUV1H220JCV	22p	
C808	ECUV1H330JCV	33p	
C809	ECUV1H330JCV	33p	
C810	ECUV1C104KBV	0.1	
C811	ECUV1H103KBV	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C812	ECUV1H333KBV	0.033	S
C813	ECUV1C104KBV	0.1	
C814	ECUV1C104KBV	0.1	
C816	ECUV1C104KBV	0.1	
C820	ECUV1H471JCV	470p	S
C821	ECUV1H471JCV	470p	S
C822	ECUV1H471JCV	470p	S
C823	ECUV1H471JCV	470p	S
		(OTHERS)	
E1	PQGP10217Z	PANEL, LCD	PC-HB
E2	L5ACAHC00007	LIQUID CRYSTAL DISPLAY	
E3	PQJE10110Z	CONNECTOR, ZEBRA	
E4	PQHR10937Z	SPACER, LCD	
CN801	PQJS34X54Z	CONNECTOR, 34P	S

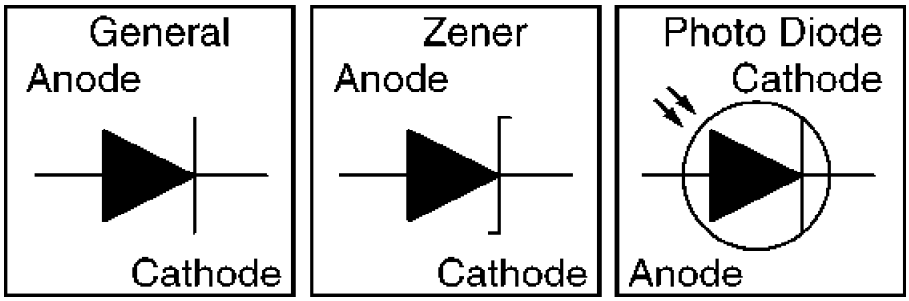
17.2. Accessories and Packing Materials

Ref. No.	Part No.	Part Name & Description	Remarks
		(ACCESSORIES)	
A1	PQJA10075Z	CORD, TELEPHONE	
A2	PQJA212M	CORD, HANDSET	
A3	PQJXE0511Z	HANDSET	
A4	PQQX13486Z	INSTRUCTION BOOK	
		(PACKING MATERIALS)	
P1	XZB20X35A01	PROTECTION COVER	
P2	PQPK13833Z	GIFT BOX	

18. FOR SCHEMATIC DIAGRAM

1. SW1: Hook switch.
2. SW2: Ringer selector.
3. DC voltage measurements are taken with electronic voltmeter from negative voltage line.
4. (Add 40 mA to telephone line from the loop simulator.)
5. Off-hook condition
6. No Mack: Handset Mode
7. This schematic diagram may be modified at any time with the development of new technology.
8. The shades area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
9. When servicing, it is essential that only manufacture's specified

parts be used for the critical components in the shaded areas of the schematic.



18.1. Memo

19. SCHEMATIC DIAGRAM

19.1. Main P.C. Board

19.2. CPU P.C. Board

20. CIRCUIT BOARD

20.1. Main P.C. Board

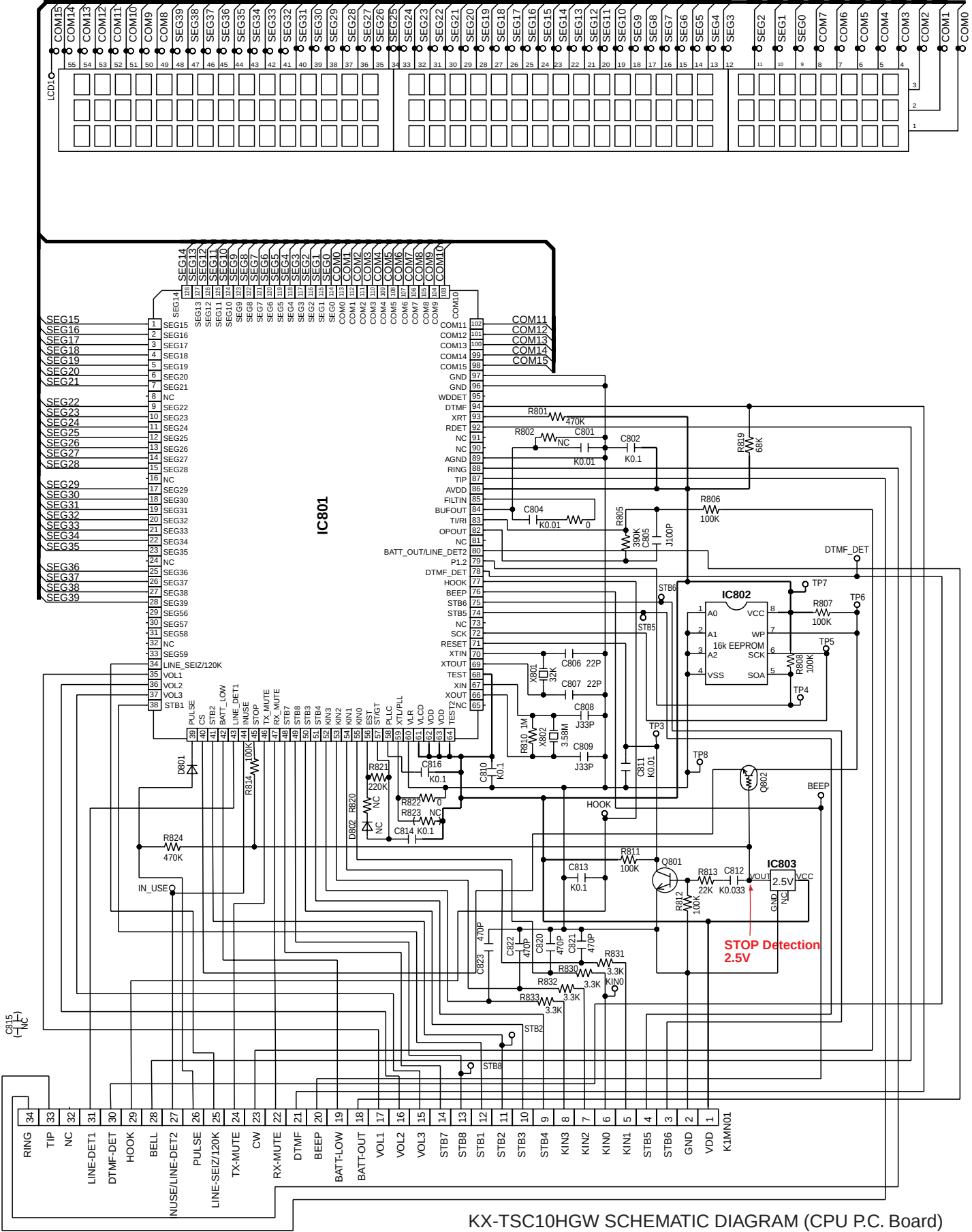
20.1.1. Component View

20.1.2. Flow Solder Side View

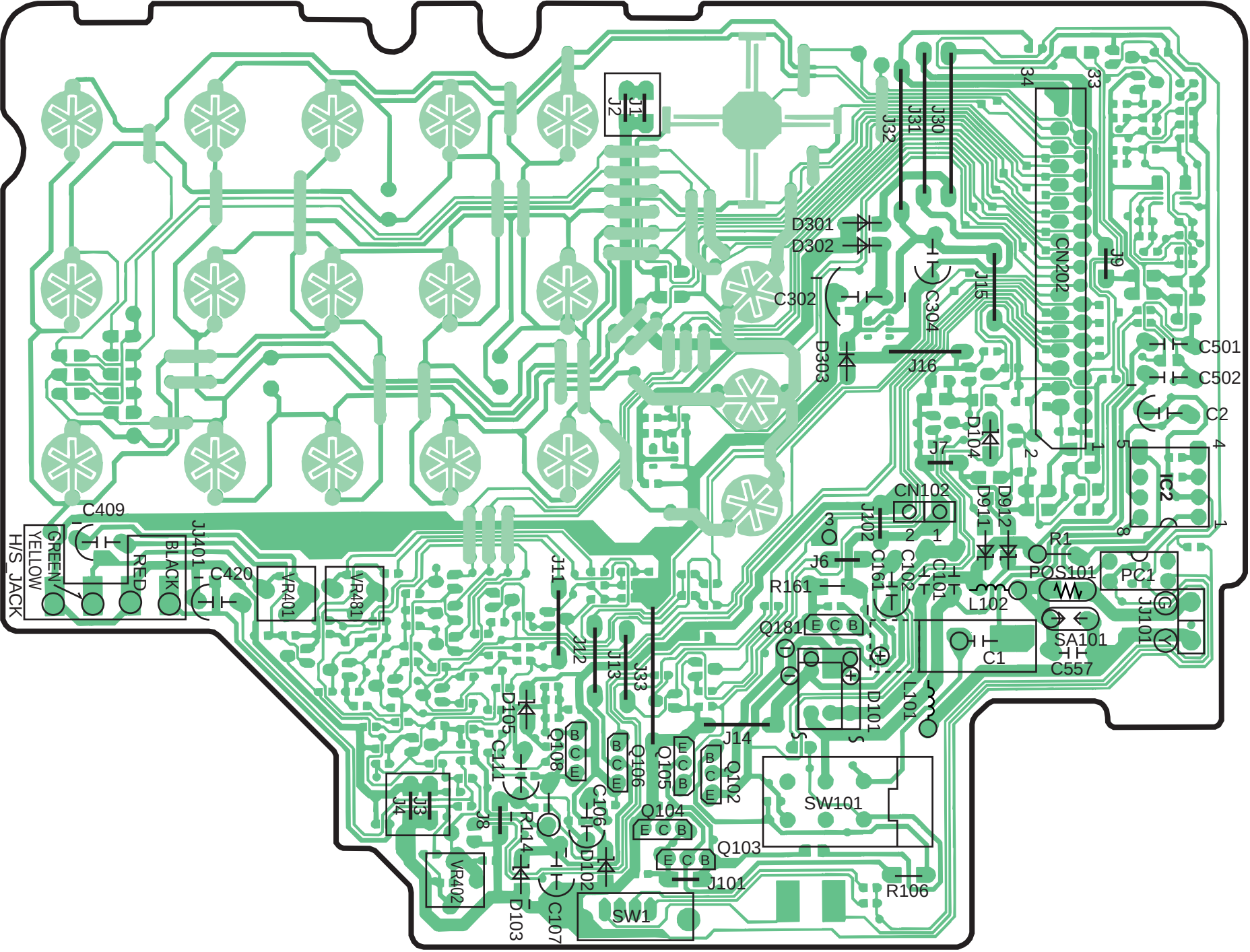
20.2. CPU P.C. Board

20.2.1. Component View

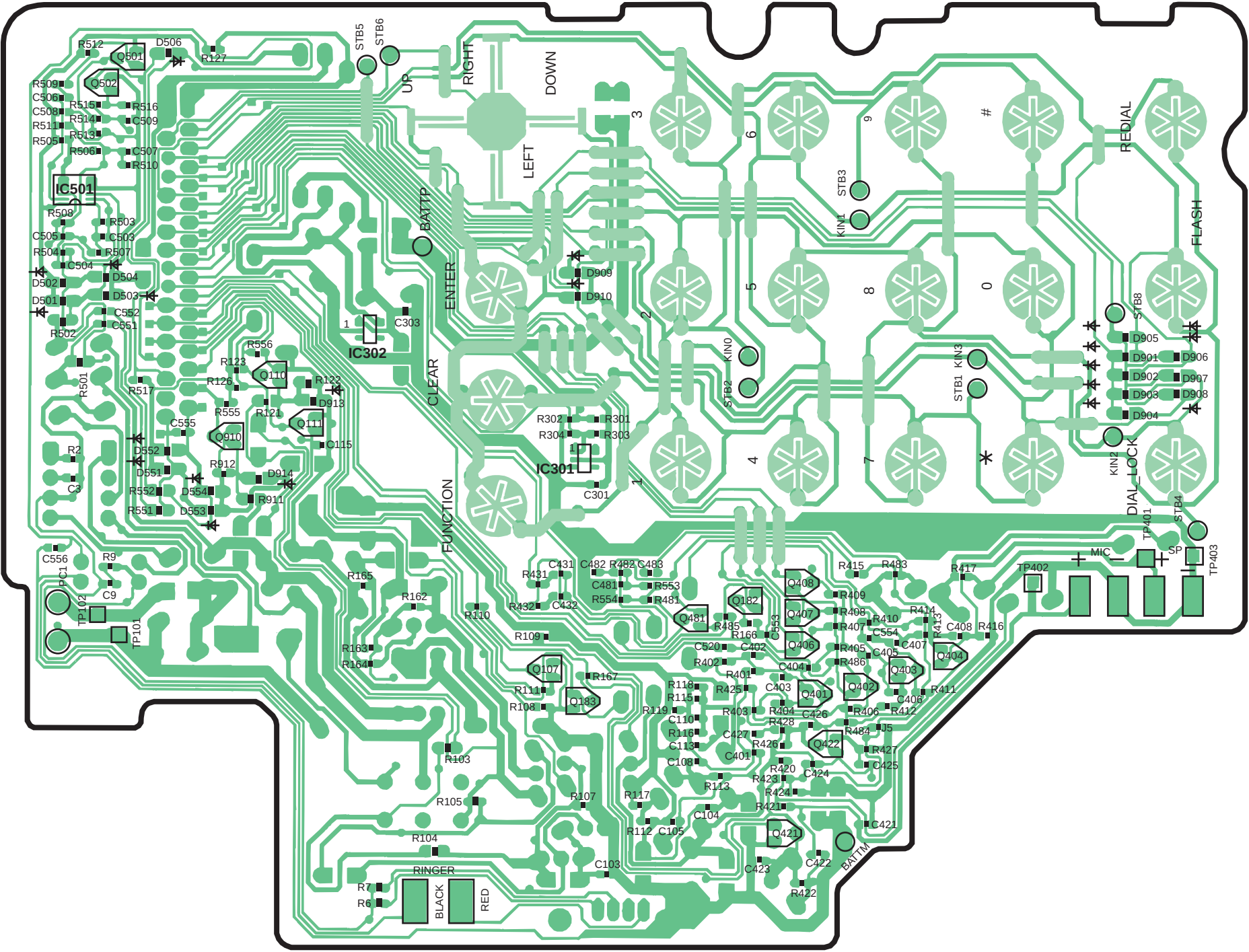
20.2.2. Flow Solder Side View



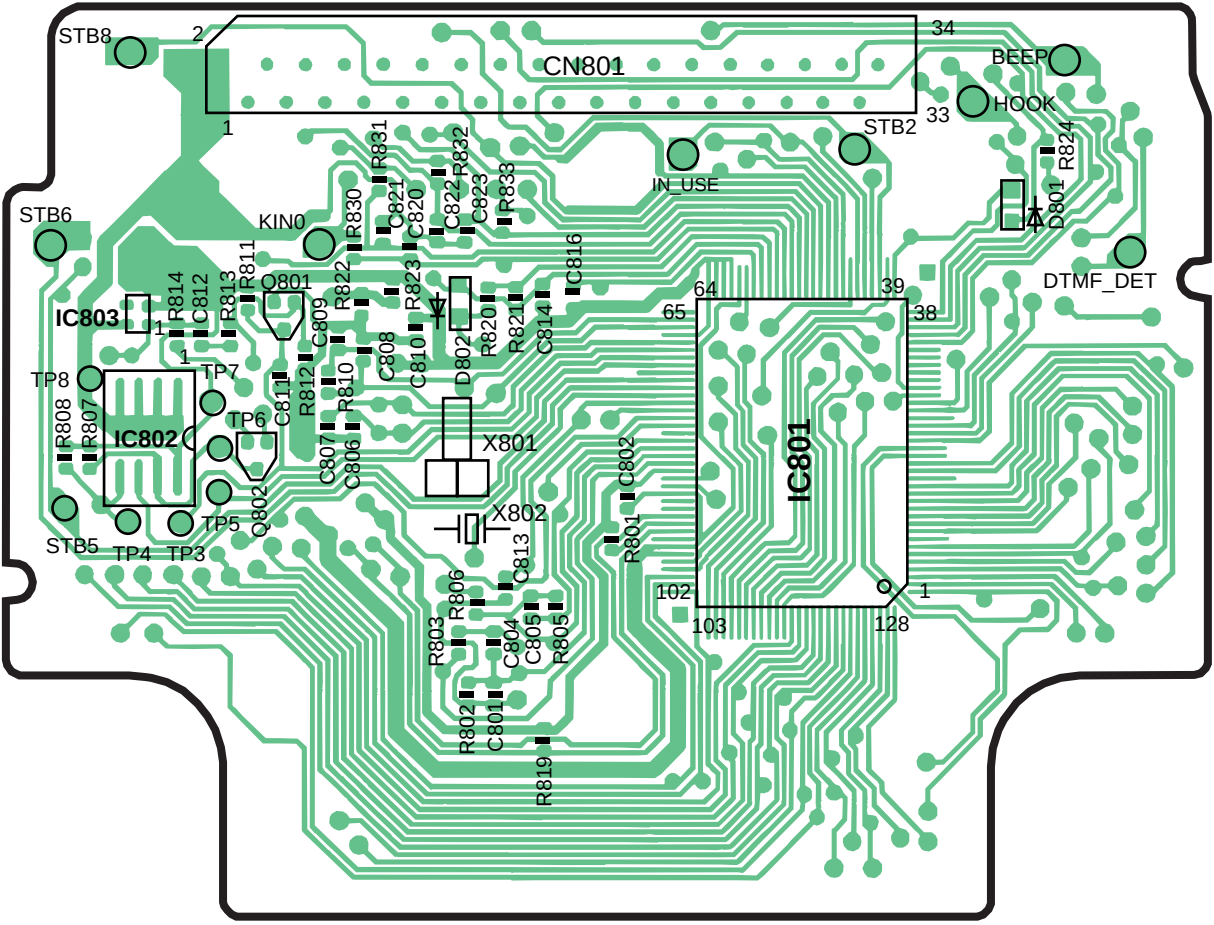
KX-TSC10HGW SCHEMATIC DIAGRAM (CPU P.C. Board)



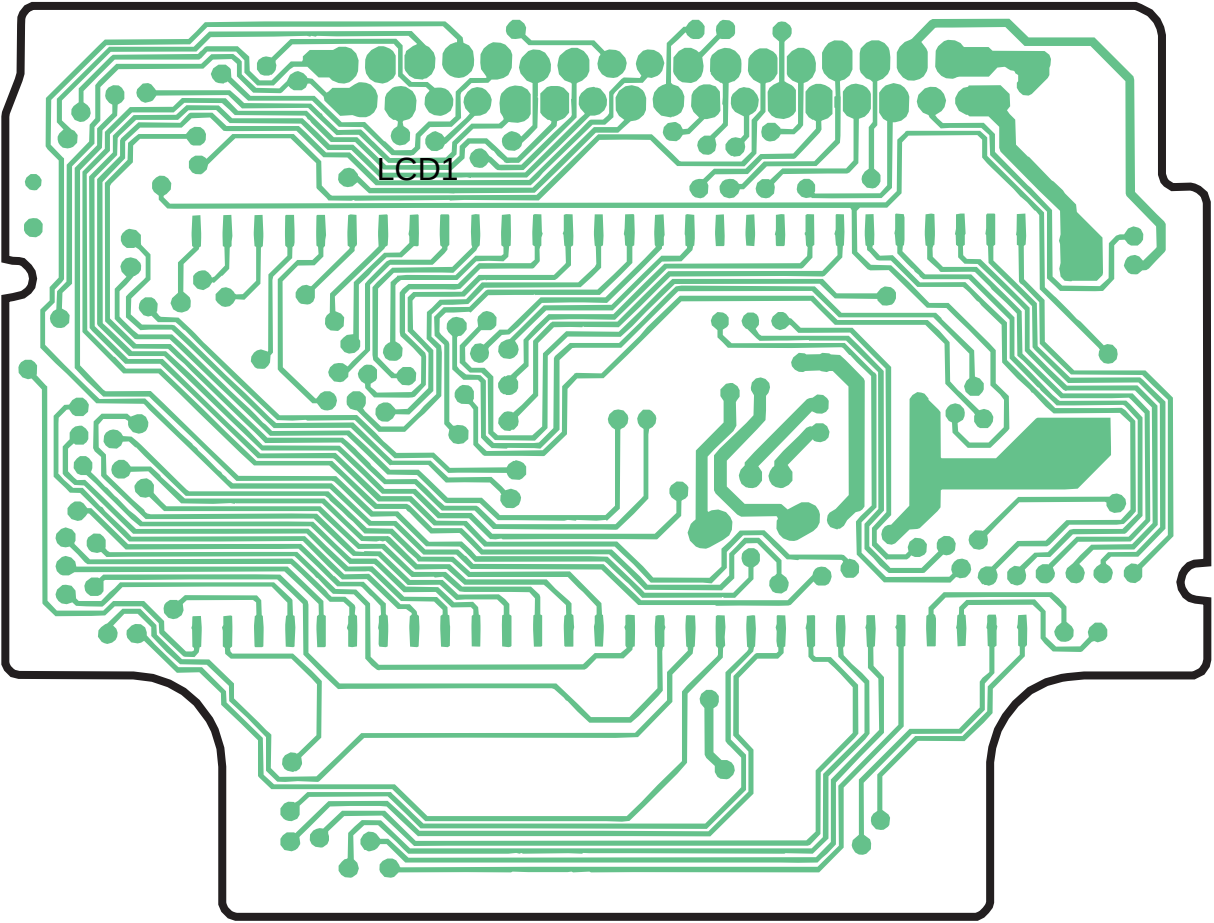
KX-TSC10HGW CIRCUIT BOARD (Main P.C. Board) Component View



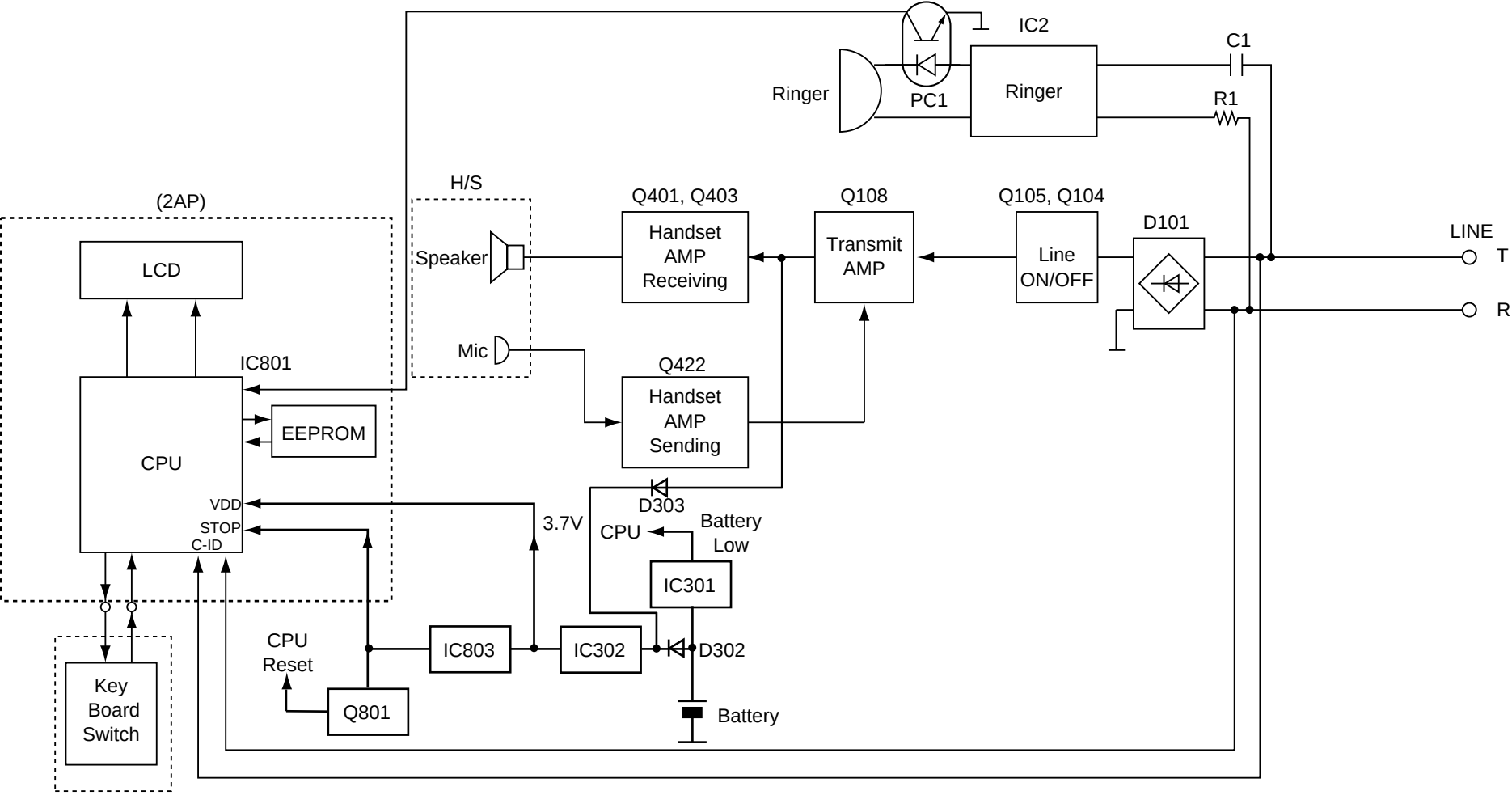
KX-TSC10HGW CIRCUIT BOARD (Main P.C. Board) Flow Sloder Side View



KX-TSC10HGW CIRCUIT BOARD (CPU P.C. Board) Component View



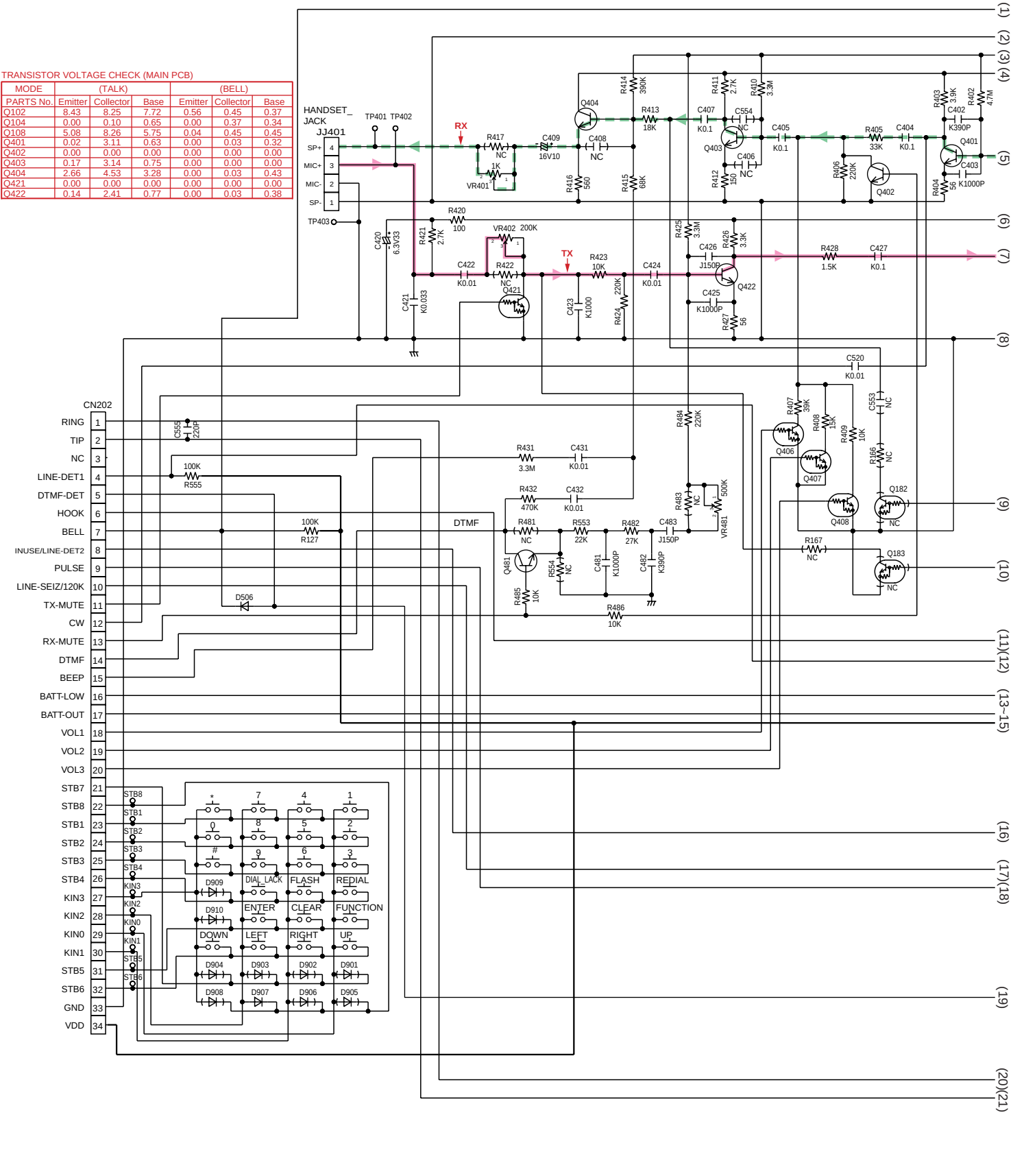
KX-TSC10HGW CIRCUIT BOARD (CPU P.C. Board) Flow Sloder Side View

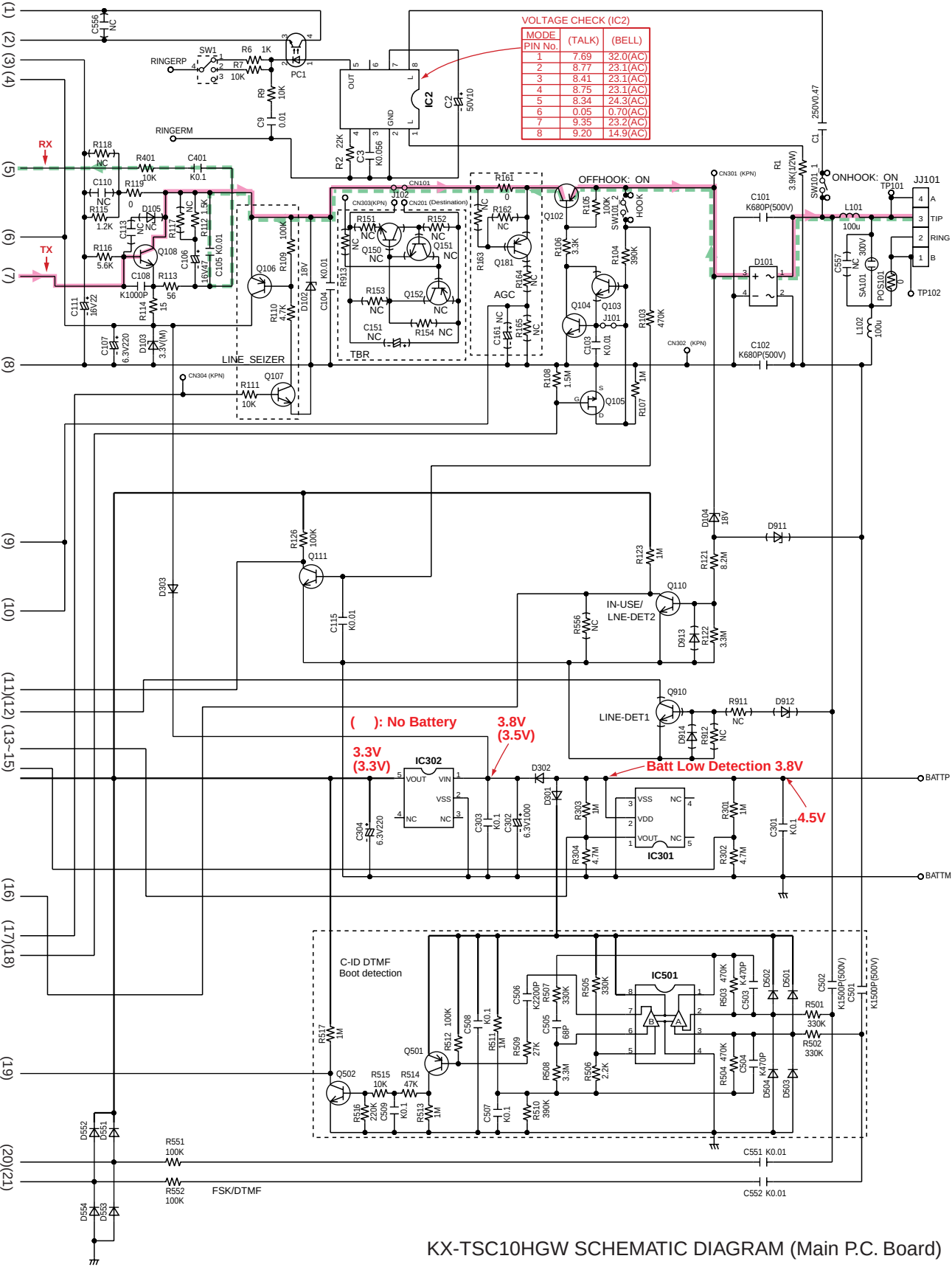


KX-TSC10HGW : BLOCK DIAGRAM

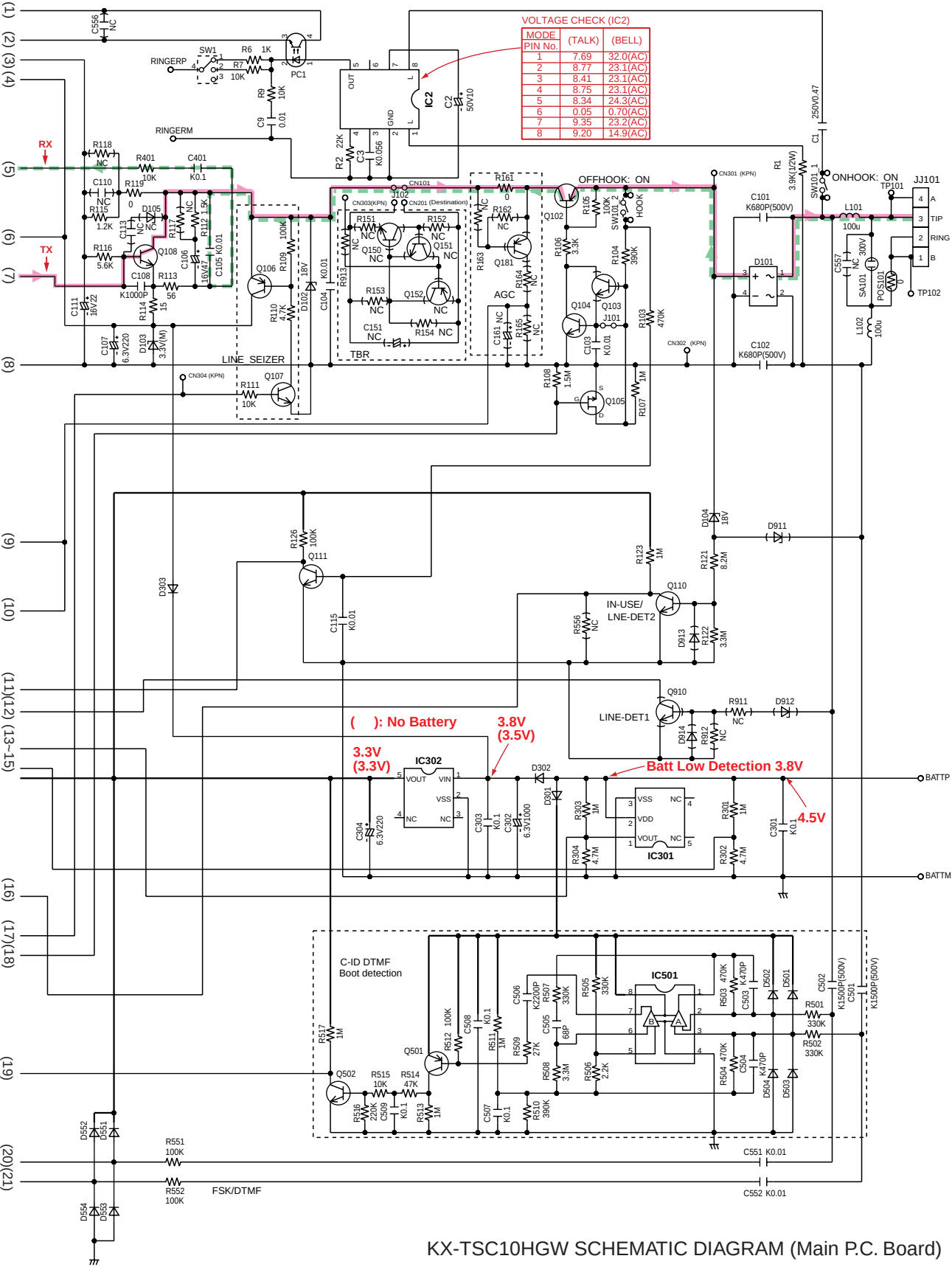
TRANSISTOR VOLTAGE CHECK (MAIN PCB)

MODE	(TALK)			(BELL)		
PARTS No.	Emitter	Collector	Base	Emitter	Collector	Base
Q102	8.43	8.25	7.72	0.56	0.45	0.37
Q104	0.00	0.10	0.65	0.00	0.37	0.34
Q108	5.08	8.26	5.75	0.04	0.45	0.45
Q401	0.02	3.11	0.63	0.00	0.03	0.32
Q402	0.00	0.00	0.00	0.00	0.00	0.00
Q403	0.17	3.14	0.75	0.00	0.00	0.00
Q404	2.66	4.53	3.28	0.00	0.03	0.43
Q421	0.00	0.00	0.00	0.00	0.00	0.00
Q422	0.14	2.41	0.77	0.00	0.03	0.38





KX-TSC10HGW SCHEMATIC DIAGRAM (Main P.C. Board)



KX-TSC10HGW SCHEMATIC DIAGRAM (Main P.C. Board)